

APPENDIX VI

Biological Assessment

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**Draft Biological Assessment
for
PL 84-99 Emergency Levee Rehabilitation Program
and
Advanced Measures Civil Emergency Management Program**

Project Location: The proposed projects are located on numerous levees enrolled in the U.S. Army Corps of Engineers (USACE) PL 84-99 Program and/or in low-lying areas of towns/cities in Iowa, Missouri, Montana, Nebraska, North Dakota, South Dakota, and Wyoming. To be included in the PL 84-99 Program, levees must be routinely inspected and meet USACE construction and maintenance standards. Please refer to the attached for a list of waterways in the states and counties where levee assistance would likely occur, and the threatened and endangered species within each county.

Authority: These projects are authorized under the authorities of 33 U.S.C. 701n (commonly referred to as Public Law 84-99); the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5121 *et seq*); Army Regulation 500-60, Disaster Relief; and Engineer Regulation 1130-2-530, Flood Control Operations and Maintenance Policies. These authorities allow the USACE to provide a levee rehabilitation program for repairing levees after flood events and/or perform advanced measures prior to flooding or flood fighting to protect against loss of life and significant damages to urban and/or public facilities.

Project Purpose: The purpose of the PL 84-99 Emergency Levee Rehabilitation Program and Advance Measures Civil Emergency Management Program projects is to provide emergency assistance to levee districts and communities in the form of emergency levee repair back to design standards and/or emergency flood damage reduction.

This Biological Assessment, in accordance with Section 7(c) of the Endangered Species Act (ESA) of 1973, as amended, evaluates and generally outlines the types of impacts and potential effects of the proposed levee repairs on listed and proposed species and designated and proposed critical habitat to determine whether any such species or habitat are likely to be adversely affected by the proposed levee repair projects. These projects share a strong similarity in terms of construction methods employed with recurring minor impacts to the same species and can be considered for a programmatic consultation with U.S. Fish and Wildlife Service (USFWS).

As the District begins to plan site-specific work, individual Environmental Assessments (EA) will be tiered from the Programmatic EA for Emergency Levee Rehabilitation Program and the Advanced Measures Civil Emergency Management Program. If the Tiered EA concludes that site-specific activities may affect a listed or proposed species and/or critical habitat and cannot be avoided or mitigated as specified herein, or a type of impact was not anticipated and addressed in this BA or the Programmatic EA, then additional informal consultation would be initiated with the USFWS.

Upon receiving concurrence from the USFWS on the findings in this BA, a general understanding will be established between the Corps and USFWS on the types and magnitude of impacts that would be allowed, and the avoidance, minimization, or mitigation measures that would be required to offset those impacts. This programmatic BA is intended to simplify and improve the efficiency of the Section 7 consultation process to ensure that site-specific actions of the proposed levee repair projects are not likely to jeopardize the continued existence of any federally listed species or destroy or adversely modify critical habitat.

Project Description: The proposed projects would provide rehabilitation or advanced measures assistance to Federal and non-Federal levee sponsors along the Missouri River and its tributaries as long as they participate in the PL 84-99 Program. The Recommended Plans would not involve permanent or increased obstructions to the floodway. The rehabilitation of levees usually consists of repairs through minor levee setbacks and/or repairs of existing structures to their previous condition. Advanced Measures responses consist of temporary flood-fight structures that are removed once the high flow event has passed. The recommended plans consist of structural repairs, non-structural repairs, and advanced measures responses as described below.

Structural Repairs. Levees provide flood risk management by basically containing flood waters in the main river channel. This alternative would repair both damaged non-Federal and Federal levees after high flow events under PL 84-99. Repairs would be limited to restoring the same level of flood risk management to the area that existed prior to any high flow damage.

Structural repairs typically consist of in-place repairs and/or minor levee setbacks. Examples of damages that are typically repaired in-place include lost protective vegetative cover, levee slope and/or toe failures, erosion along the levee slope and/or toe, damaged drainage structures, minor scour holes, and minor levee breaches. In general, the less damaged a levee is, the more likely it is to be repaired in-place. Levee setbacks, or reconstructing the levee landward on a new alignment, are typically used in locations that have been subject to more severe damages, such as a major levee breach, severe erosion of the levee, and large scour holes.

Levee repairs require the use of heavy equipment, such as bulldozers, excavators, scrapers, dump trucks, and in certain locations, hydraulic dredges. Equipment is used to obtain, move, shape, and compact earthen materials in order to complete levee repairs. Berms are usually placed about 150 feet landward of the levee for reinforcement. Drill rigs may be used on the landward side of the levee for placement of new relief wells. Earthen material needing to be hauled to the project site would require the use of access roads. County roads are used as a first option, and if these are not available, then farm roads or fields may be used at the discretion of the landowner and may require a temporary easement. Access through wetlands, water crossings or treed areas are avoided due to the potential damage that may be caused in disturbing those types of habitat and also because of the significant increase in cost to secure an easement. Staging areas are usually placed as close to the levee toe as possible, and trucks and equipment utilize the existing right-of-way of the levee system and the top of the levee; however, in some instances the levee system is extensive and staging areas may be off-site relative to where the repairs are taking place within

that levee system. In these instances, staging areas utilize county roads, farm roads, or fields to gain access to the levee area being repaired.

After construction is complete, the levee and other areas disturbed by construction activities would be replaced with topsoil and reseeded to minimize soil erosion.

Levee setbacks often benefit the environment by returning small portions of land to the floodplain. All levee rehabilitation projects under this alternative would undergo environmental and cultural resources reviews, an engineering review, and an economic benefit to cost analysis to determine the most acceptable repair method.

Non-Structural Repairs. Non-structural responses must be requested by the public sponsor. Under this alternative, flood risk management would be provided by modifying structures and property to reduce damages during flood events. Examples of non-structural responses include relocating structures, buyouts of buildings and property, elevating structures, and providing ring levees. Levee setbacks undertaken for purposes of restoring the floodplain or floodway also would fit into the nonstructural category. The majority of developed areas are protected by urban levees, which are highly engineered and provide a much higher level of flood risk management compared to agricultural levees. Most of the levees in NWO's PL 84-99 program protect urban areas. The most practical non-structural solutions would likely include setbacks and property buyouts.

Advanced Measure Responses. These measures consist of a combination of low-lying earthen embankments, sandbag structures, and/or innovative flood fight structures (e.g., Hesco Bastions) to minimize potential flood damages. A single course of action is developed due to the emergency nature of the proposed projects. The Advanced Measures are generally placed in locations where 'voids' in the existing flood management structures occur and are removed once the high flow event has passed. Hesco bastions are typically placed along the shoulders of roadways as they need a solid foundation to be most effective. Equipment may include front-end loaders and dump trucks to bring in materials for building earthen embankments or to fill sandbags and/or Hesco Bastions with soil/sand. Typically, areas where advanced measures are placed are more readily accessible as they are closer to developed areas and do not usually require temporary access roads. Advanced measures may also include the reinforcement of an existing levee before a flood event occurs and would consist of similar activities as described for a structural repair.

The ability to place earthen levees in all locations may be restricted due to constructability and limited available space. There may be other infrastructure outside of the areas protected by flood control structures that may require flood fight assistance. In these instances, the Omaha District will provide the entities with flood fight and flood proofing techniques to be disseminated to the affected residents.

Under any of the proposed action alternatives, no significant environmental impacts are anticipated provided that specific site-selection criteria and, if necessary, appropriate mitigation

measures discussed in this BA or Programmatic EA, are applied to each site proposed for levee repair.

Existing Conditions: Most levees are manmade structures and are devoid of trees, shrubs, and bushy vegetation. Levees are generally planted with easy-maintainable grasses that are frequently mowed. Habitat conditions along levees are generally limited to loafing areas or areas of limited feeding of insects, small mammals, and/or birds. Following high flow events and breeches in levees, large expanses of sand and silt from river wash may be left on farm fields or on open expanses of land.

Environmental Impacts: Anticipated environmental impacts would be related to construction activities and would likely result in temporary disturbance to feeding, breeding and sheltering of fish and wildlife, and temporary disturbance to the habitats upon which they depend. The proposed levee repair projects and associated site-specific activities are not intended or expected to generate appreciable change in habitat conditions as compared with conditions pre-existing the flood event. There is the potential for minor changes in water clarity during and immediately after construction, but these are considered temporary with no adverse impacts to fish and wildlife anticipated if best management practices and standard operating procedures are implemented. Construction noise may temporarily disturb any wildlife in the project area, but it would be of short duration, and wildlife would most likely return after construction activities cease. Construction would be avoided to the extent feasible during the spawning period of listed fish, reptile or amphibian species identified by USFWS that may be present in a specific project area; however, if construction cannot be avoided during these times, surveys would be conducted and consultation with USFWS initiated. Construction would also be avoided during the primary nesting season of migratory birds, including bald and golden eagles; if construction during the primary nesting season cannot be avoided, then a qualified biologist would conduct a survey for the presence of active nests and mitigation measures would be implemented to minimize potential adverse impacts.

Borrow sites for the purpose of the proposed levee repair projects may be obtained from previously used borrow sites, new borrow sites, commercial sites, the Missouri River, or accumulated sediment from the Missouri River Bank Stabilization and Navigation Project (BSNP) fish and wildlife mitigation sites (e.g., side channels, backwaters, or wetlands), and associated floodplain adjacent to these sites. Dredging material from mitigation projects would consist of material to reestablish or create backwaters, chutes, wetlands, etc; however, only borrow material removed to complete the mitigation project would be available for use. Borrow locations will be selected in accordance with NWO's Standard of Practice (SOP) for the Selection of Borrow Sites. Guidelines developed in this SOP were coordinated with the USFWS. In general, the guidelines for borrow site selection and tree removal are summarized below:

Preferred selection of borrow locations would consist of riverward borrow areas in open prior converted croplands or farmed wetlands (within 1,000 feet of a levee break) and old borrow area and scour holes that are filled with sediment.

Alternative selections would include landward borrow areas in open agricultural fields, Missouri River BSNP fish and wildlife mitigation sites, and adjacent floodplains to these mitigation sites.

Listed below are a few general criteria that would be considered when selecting borrow sites. A complete listing of conditions can be viewed in the NWO's SOP for the Selection of Borrow Sites.

- Tree clearing, especially involving mature trees will be avoided. Riverward areas with woody vegetation cover of less than nine inches diameter breast height (DBH) may be used if preferred areas are not available. Borrow areas will be dug as deep as possible to minimize tree clearing. If levee repairs are not feasible without the removal of trees larger than nine inches dbh, the USACE will delineate the borrow area to lessen adverse impacts and reduce the number of trees removed. Further coordination with the USFWS will take place on a case-by-case basis if mitigation for the loss of mast-producing trees is warranted or when proposed actions would impact on-half acre or more of trees averaging greater than nine inches dbh.
- At least an 80 to 100 foot wide band of timber should be maintained between the levee and the river bank.
- Selecting timber stands that died as a result of a flood event over living trees; however, dead trees that have potential for large cavity-nesting or den trees should be preserved.

Staging Areas and Access Roads: Construction staging areas would be located as near to the existing levee or within the existing levee footprint as possible. Wherever feasible, the repair work and staging would take place from the top of the levee. In general, the Contractor would confine all activities to areas defined by USACE plans and specifications. Where practical, existing roads would be used for temporary access. Access through wetlands, water crossings or treed areas would be avoided. Best management practices (BMPs) will be implemented to minimize potential impacts from fuels, lubricants, and hydraulic fluid from the equipment. Disturbed sites, staging areas, and temporary access roads will be re-seeded with native grasses when construction has been completed.

Dredging Activities: Dredging activities would be necessary for the collection of accumulated material from existing recovery and mitigation projects affected by the 2011 flood event to be used for levee repairs. To access these areas, the dredges would enter and exit from the main Missouri River channel, dredging their way toward established floodplain borrow sites. Upon completion, dredgers would leave behind either restored chutes and off channel habitats as previously established during Missouri River Recovery efforts, and/or newly established off channel areas in the floodplain that would have ecological benefits to fish and other aquatic species. In the unlikely event that the floodplain is unable to provide needed quantities, dredging from the main Missouri River channel would be conducted. Missouri River channel dredging would be used only as a last resort and it is currently believed that channel dredging will not be

needed for these projects but that determination will be made as construction progresses and the USFWS consulted. Dredging could directly affect adult and juvenile pallid sturgeon through entrainment in the dredge, encounters with boat propellers, or noise disturbance. Potential effects and measures to minimize these effects are discussed in greater detail under the Protected Fish and Wildlife Species section.

Biology and Distribution of Listed, Proposed and Candidate Species

Endangered Species: In accordance with Section 7 of the Endangered Species Act, the U.S. Fish and Wildlife Service's (USFWS) web pages (www.fws.gov) for listed species occurring in Iowa, Missouri, Montana, Nebraska, North Dakota, South Dakota, and Wyoming were consulted to determine which federally listed threatened, endangered, or candidate species could potentially occur in the proposed project areas. An endangered species is the classification provided to an animal or plant in danger of extinction within the foreseeable future throughout all or a significant portion of its range. A threatened species is the classification provided to an animal or plant likely to become endangered within the foreseeable future throughout all or a significant portion of its range. A candidate species is a plant or animal that has been studied and the USFWS has concluded that they should be proposed for addition to the Federal endangered and threatened species list. Table 1 lists the species found in the counties where levees enrolled in the PL 84-99 program occur.

Table 1: Federally Listed Threatened and Endangered Species

Scientific Name	Common Name	Status	Habitat
<i>Nicrophorus americanus</i>	American Burying Beetle	Endangered	Undisturbed areas; grassland, forest edge, scrublands
<i>Mustela nigripes</i>	Black-Footed Ferret	Endangered	Prairie Dog Habitats
<i>Penstemon haydenii</i>	Blowout Penstemon	Endangered	Sparsely vegetated sandy blowouts
<i>Gila elegans</i>	Bonytail Chub	Endangered	Rivers
<i>Salvelinus confluentus</i>	Bull Trout	Threatened	Rivers
<i>Lynx canadensis</i>	Canada Lynx	Threatened	Northern forests
<i>Gaura neomexicana coloradensis</i>	Colorado Butterfly Plant	Threatened	Wetlands habitats
<i>Ptychocheilus lucius</i>	Colorado Pike Minnow	Endangered	Rivers
<i>Hesperia dacotae</i>	Dakota Skipper	Candidate	Bluestem prairie and upland (dry) prairie
<i>Boltonia decurrens</i>	Decurrent False Aster	Threatened	Moist, sandy, floodplains
<i>Yermo xanthocephalus</i>	Desert Yellowhead	Threatened	Shallow deflation hollows
<i>Sistrurus c. catenatus</i>	Eastern Massasauga	Candidate	Wet areas and adjacent uplands
<i>Numenius borealis</i>	Eskimo Curlew	Endangered	Tundra wetlands
<i>Boechera pusilla</i>	Fremont County Rockcress	Candidate	Exposed granite-pegmatite outcrops
<i>Myotis grisescens</i>	Gray Bat	Endangered	Caves in limestone karst areas
<i>Canis lupus</i>	Gray Wolf	Threatened	Wide territories is the US
<i>Centrocercus urophasianus</i>	Greater Sage Grouse	Candidate	Sagebrush vegetation
<i>Ursus arctos horribilis</i>	Grizzly Bear	Threatened	Forests, meadows, grasslands nears mountains
<i>Lampsillis higinseii</i>	Higgins Eye Pearly Mussel	Endangered	Large Rivers
<i>Somatochlora hineana</i>	Hine's Emerald Dragonfly	Endangered	Streams & wetlands overlying dolomite bedrock
<i>Gila cypha</i>	Humpback Chub	Endangered	Rivers
<i>Myotis sodalis</i>	Indiana Bat	Endangered	Caves, stream corridors, upland forests

Table 1: Federally Listed Threatened and Endangered Species Continued			
<i>Sternula antillarum</i>	Least Tern	Endangered	Coastal beaches and river sandbars
<i>Discus macclintocki</i>	Iowa Pleistocene Snail	Endangered	Cool and moist hillsides
<i>Asclepias meadii</i>	Mead's Milkweed	Threatened	Upland tall grass, late-successional prairie
<i>Charadrius montanus</i>	Mountain Plover	Proposed	Short grass prairie
<i>Gulo gulo luscus</i>	North American Wolverine	Candidate	Alpine, boreal, and arctic forests/ tundra
<i>Scaphirhynchus albus</i>	Pallid Sturgeon	Endangered	Large, turbid, warm-water rivers
<i>Lampsilis orbiculata</i>	Pink Mucket Mussel	Endangered	Rivers
<i>Charadrius melodus</i>	Piping Plover	Threatened	River sandbars
<i>Lespedeza leptostachya</i>	Prairie Bush Clover	Threatened	Dry to mesic prairies with gravelly soil
<i>Quadrula cylindrical cylindrica</i>	Rabbits Foot Mussel	Candidate	Small to medium-sized streams
<i>Xyrauchen texanus</i>	Razorback Sucker	Endangered	Rivers
<i>Trifolium stoloniferum</i>	Running Buffalo Clover	Endangered	Disturbed bottomland meadows
<i>Cicindela nevadica lincolniiana</i>	Salt Creek Tiger Beetle	Endangered	Saline wetlands
<i>Leptodea leptodon</i>	Scaleshell Mussel	Endangered	Rivers
<i>Plethobasus cyphus</i>	Sheep-Nose Mussel	Proposed	Rivers
<i>Botrychium lineare</i>	Slender Moonwort	Candidate	Meadows
<i>Cumberiandia monodonta</i>	Spectaclecase Mussel	Proposed	Rivers
<i>Anthus spragueii</i>	Sprague's Pipit	Candidate	Short grass Prairie Avoids cultivation
<i>Notropis topeka</i>	Topeka Shiner	Endangered	
<i>Spiranthes diluvialis</i>	Ute Ladies' Tresses	Threatened	Moist soils
<i>Helenium virginicum</i>	Virginia Sneezeweed	Threatened	Seasonal wetlands
<i>Zaitzevia thermae</i>	Zaitzevian Riffle Beetle	Candidate	Warm springs
<i>Howellia aquatilis</i>	Water Howellia	Threatened	sediments associated with glacial potholes
<i>Platanthera praeclara</i>	Western Prairie-Fringed Orchid	Threatened	Wet prairies and sedge meadows
<i>Pinus albicaulis</i>	White Bark Pine	Candidate	Subalpine & alpine sites (above 8000 ft)
<i>Grus americana</i>	Whooping Crane	Endangered	Open expanses and wetlands
<i>Coccyzus americanus</i>	Yellow-Billed Cuckoo	Candidate	Woody riparian

Protected Plant Species:

Blowout Penstemon (*Penstemon haydenii*)-Endangered

Blowout Penstemon is a short-lived perennial, frequently occurring in large, multi-stemmed clumps containing flowering and vegetative stems. Vegetative stems are commonly up to 1 foot tall, but can sometimes reach nearly 2 feet. Blowout Penstemon is found in sparsely vegetated sandy blowouts in the early stages of plant community development composed of blowout grass (*Redfieldia flexuosa*), lemon scurf-pea (*Psoralidium lanceolatum*), and thickspike wheatgrass (*Elymus lanceolatus*) or Indian ricegrass (*Achnatherum hymenoides*). Blowout Penstemon is in decline due to improvement of land management practices and control of fire in the Sandhills that limit blowout habitat conditions.

Potential Effects and Conservation Measures: No affect. Habitat for the Blowout Penstemon is not likely to be found in project areas. No conservation measures identified.

Colorado Butterfly Plant (*Gaura neomexicana coloradensis*)-Threatened

The Colorado butterfly plant occurs primarily in southeastern Wyoming, north central Colorado, and extreme western Nebraska. The Colorado butterfly plant is typically found in wetlands habitats along the meandering stream channels on the high plains. In undisturbed sites, it grows among native grasses. The Colorado butterfly plant prefers open habitat that is not substantially overgrown by other vegetation. As ecological succession continues and more vegetation begins to take over its habitat, the Colorado butterfly plant tends to die out. Historically, flooding was probably the most important type of disturbance creating and maintaining open habitat. Wildfire and grazing also were historically present and were likely important in creating and maintaining Colorado butterfly plant habitat.

Potential Effects and Conservation Measures: No affect. Prefers an open wetland type habitat sustained by flooding. Habitat not likely to be found along maintained levee systems. No conservation measures identified.

Decurrent False Aster (*Boltonia decurrens*)-Threatened

Decurrent False Aster is found on moist, sandy, floodplains and prairie wetlands along the Illinois River. It relies on periodic flooding to scour away other plants that compete for the same habitat. Excessive silting seems to be a major cause of the decurrent false aster's decline. Highly intensive agricultural practices have increased topsoil runoff, which smothers seeds and seedlings. Habitat destruction is another threat. Agriculture has eliminated wet prairies and marshes within the species' range, natural lakes have been drained and converted to row crops. Building levees along rivers and draining wetlands for cultivation has also changed patterns of flooding and eliminated habitat. Herbicides also kill these plants and may be a factor in the decline of the species. Several communities of decurrent false asters have been found in areas of low-intensity agriculture.

Potential Effects and Conservation Measures: No affect. Prefers sandy floodplains with periodic flooding. This habitat type most likely would not be found along maintained levee systems. No conservation measures identified. Fremont County Rockcress (*Boechera pusilla*)-Candidate This perennial herb has several long, slender stems that grow along the ground. Its small, light lavender, four-petaled flowers blossom from May to mid-June. The Fremont County rockcress is endemic to sparsely vegetated, coarse, granitic soil pockets in exposed granite-pegmatite outcrops, with slopes generally less than 10 degrees. The only known population of Fremont County rockcress is located at 8,000-8,100 feet in elevation on lands administered by the Bureau of Land Management in the southern foothills of the Wind River Range. Threats to the species may be related to drought, disease, or other factors.

Potential Effects and Conservation Measures: No affect. Within the project areas, this species has been found in the vicinity of Wind River in Wyoming. Proposed levee repairs are not proposed in this area. No conservation measures identified.

Mead's Milkweed (*Asclepias meadii*)-Threatened

Mead's milkweed has a single slender unbranched stalk, 8 to 16 inches high, without hairs but with a whitish waxy covering. The hairless leaves are opposite, broadly ovate, 2 to 3 inches long, 3/8 to 2 inches wide, also with a whitish waxy covering. A solitary umbel (an umbrella-like cluster of flowers) at the top of the stalk has 6 to 15 greenish, cream-colored flowers. Milkweed requires moderately wet (mesic) to moderately dry (dry mesic) upland tallgrass prairie or glade/barren habitat characterized by vegetation adapted for drought and fire. It persists in stable late-successional prairie. Mead's milkweed is threatened by the destruction and alteration of tall grass prairie due to farming along with residential and commercial development. Sites known to have Mead's milkweed were destroyed by plowing and land development. Smaller habitat fragments support lower numbers of plants, and thus, fragmentation may hasten or explain the loss of genetic diversity and failure of this plant to sexually reproduce. Populations with low numbers may not attract sufficient numbers or types of pollinators. This milkweed is currently known from 171 sites in 34 counties in eastern Kansas, Missouri, south-central Iowa, and southern Illinois. Most Kansas and Missouri populations occur in prairie hay fields where mowing typically takes place in late June to early July, which removes immature Mead's milkweed fruits and prevents completion of the plant's life cycle.

Potential Effects and Conservation Measures: No affect. Occurs in upland prairies where levee repair work is unlikely to occur. No conservation measures identified.

Prairie Bush Clover (*Lespedeza leptostachya*)-Threatened

Prairie bush clover is a prairie plant found only in the tall grass prairie region. It is a member of the bean family and a midwestern "endemic", known only from the tallgrass prairie region of the upper Mississippi River Valley. Some of the surviving populations are threatened by conversion of pasture to cropland, overgrazing, agricultural expansion, herbicide application, urban expansion, rock quarrying, and transportation right-of-way maintenance and rerouting; hybridization with the more common round-headed bush clover has also been identified as a potential threat in some areas.

Potential Effects and Conservation Measures: No affect. Found in Iowa occurring in tall-grass prairies. Levee repair work is unlikely to occur in tall-grass prairie habitat. No conservation measures identified.

Running Buffalo Clover (*Trifolium stoloniferum*)-Endangered

Running buffalo clover is a perennial species with leaves divided into three leaflets. It is called running buffalo clover because it produces runners (i.e., stolons) that extend from the base of erect stems and run along the surface of the ground. The flower heads are about 1-inch wide, white, and grow on stems that are 2 to 8 inches long. Running buffalo clover is found in Indiana, Kentucky, Missouri, Ohio, and West Virginia. It has been extirpated from Arkansas, Illinois, and Kansas. Running buffalo requires periodic disturbance and a somewhat open habitat to successfully flourish, but it cannot tolerate full-sun, full-shade, or severe disturbance. Historically running buffalo clover was found in rich soils in the ecotone between open forest and prairie. Those areas were probably maintained by the disturbance caused by bison. Today, the species is found in partially shaded woodlots, mowed areas (lawns, parks, cemeteries), and along streams and trails. Running buffalo clover may have depended on bison to periodically disturb areas and create habitat, as well as to disperse its seeds. As bison were eliminated, vital habitat and a means of seed dispersal were lost. Clearing land for agriculture and development has led to elimination of populations, loss of habitat, and fragmentation of the clover populations that remain. Small, isolated populations of running buffalo clover are prone to extinction from herbivory, disease, and inbreeding. Invasive non-native species, such as white clover, garlic mustard, and Japanese honeysuckle out-compete running buffalo clover for moisture, nutrients, space, and sunlight. Non-native clovers are believed to have introduced diseases and insect predators. Natural succession has resulted in a loss of open woodlands and a reduction in running buffalo clover habitat. Excessive grazing directly kills plants through herbivory or trampling and can indirectly kill plants by degrading the habitat. Mowing may remove seed heads before seeds are mature but may help the clover by controlling competing vegetation.

Potential Effects and Conservation Measures: No affect. No potential to occur in project areas of proposed levee repairs. No conservation measures identified.

Slender Moonwort (*Botrychium lineare*)-Candidate

This small fern was once found in Idaho (Boundary County), Oregon (Wallowa County), Montana (Glacier and Lake Counties), California (Inyo County), and Colorado (Boulder and El Paso counties). Slender moonwort has also been documented in Quebec and New Brunswick, Canada. Populations in Idaho, Lake County, Montana, California, Boulder County, Colorado, and Canada are thought to no longer exist, as plants at some of these sites have not been seen since the early 1900s. The plant thrives in habitat such as meadows, under trees, and on limestone cliffs mostly at higher elevations. Today, only five known sites support slender moonwort: two in Oregon, two in Colorado and one in Montana. Four of the five sites are on Federal land; one is on private land. Remaining populations of the plant are extremely small, ranging from two to 53 individuals. Threats to this species include habitat succession due to fire suppression, livestock grazing, mining, exotic species, urban development, timber harvest, roads, recreation and naturally occurring events. All populations are potentially vulnerable to naturally

occurring events or human activities. The decline of native plant species such as slender moonwort is an indicator of the overall health of the ecosystem in which it lives.

Potential Effects and Conservation Measures: No affect. Species usually found at higher elevations. Unlikely to occur in project areas of proposed levee repairs. No conservation measures identified.

Ute Ladies' Tresses (*Spiranthes diluvialis*)-Threatened

Ute Ladies' Tresses is an obligate mesophyte, usually growing in the cobbly sand, shingly sand, gravelly sand or sandy loam of wet meadows, stream or lake margins, abandoned stream meanders, riparian sandbars and sub-irrigated springs and seeps. Occasionally it may grow in moist swales. It avoids the shade of woody shrubs and trees, especially *Tamarix*-dominated sites, and prefers open, sunny forb / graminoid-dominated habitats instead. Ute ladies-tresses has been reported from Colorado, Idaho, Montana, Nebraska, Nevada, Utah, Washington, and Wyoming, with the greatest concentration of individuals in northeast Utah. This orchid depends on natural stream processes and probably on the type of nomadic grazing typical of native ungulates. Dams and diversions have interrupted stream flooding cycles. Urbanization has also eliminated habitat characterized by periodic flooding. Grazing prior to flower stem formation may be beneficial because it limits competition from taller, more aggressive species. Season-long grazing, however, is detrimental. Heavy recreational use of riparian habitats can result in trampled plants. Weed infestations are a serious threat to Ute ladies'-tresses. This species has a very low reproductive rate, which makes it even more vulnerable to the above threats.

Potential Effects and Conservation Measures: No affect. Prefers wet sandy soils. Unlikely to occur in project areas of proposed levee repairs. No conservation measures identified.

Virginia Sneezeweed (*Helenium virginicum*)-Threatened

Virginia sneezeweed is restricted to seasonally inundated sinkhole ponds, wetlands, and meadows. Virginia sneezeweed has adapted to survive the water level fluctuations of the seasonal ponds, giving it competitive advantage in this habitat. From year to year, Virginia sneezeweed populations may greatly vary. High water level one year may leave the ponds flooded, resulting in less shoreline for plants to establish or survive. However, a high water level also eliminates invading shrubs and trees which try to colonize the pond shores. When water levels are lowered, more pond shore is exposed. This allows a sneezeweed population to bounce back from surviving plants and seeds stored in the soil. Causes for decline include: residential development, incompatible agricultural practices, filling and ditching of its wetland habitat, and other disruptions of its habitat and the hydrology that maintains it.

Potential Effects and Conservation Measures: May affect, but not likely to adversely affect. If work is to be conducted in favorable habitat (e.g., seasonal ponds), preconstruction surveys will be conducted before construction activities commence. If surveys result in a positive finding, consultation with USFWS will be initiated.

Water Howellia (*Howellia aquatilis*)-Threatened

Water howellia was listed as a Threatened species under the Endangered Species Act on July 14, 1994. Howellia grows in firm consolidated sediments associated with glacial potholes and former river oxbows which flood in spring but usually dry to some degree by late summer. Microhabitats include shallow water and the edges of deep ponds that are partially surrounded by deciduous trees such as black cottonwood and aspen. Ponds are generally found in Engelman spruce or lodgepole pine forests. Howellia is threatened by loss of wetland habitat and habitat changes due to timber harvesting, livestock grazing, residential development and competition from introduced plant species; notably reed canary grass and purple loosestrife. Potential Effects and Conservation Measures: No affect. Preferred habitat is unlikely to be found in project areas of proposed levee repairs. No conservation measures identified.

Western Prairie Fringed Orchid (*Platanthera praeclara*)-Threatened

The western fringed prairie orchid is a perennial distinguished by large, white fringed flowers that give them a feathery appearance. Historically, the orchid was found throughout the tall grass regions of North America. The prairie fringed orchids were added to the U.S. List of Endangered and Threatened Wildlife and Plants on September 28, 1989. The western prairie fringed orchid is restricted to west of the Mississippi River and currently occurs in Iowa, Kansas, Minnesota, Nebraska, North Dakota, and in Manitoba, Canada. North Dakota has the largest population of western prairie fringed orchid left in the world. The greatest threat to the prairie fringed orchids is habitat loss, mostly through conversion to cropland. Competition with introduced alien plants, filling of wetlands, intensive hay mowing, fire suppression, and overgrazing also threatens these species. These orchids have been collected because of their rarity and beauty, which also contributes to its decline. The prairie fringed orchids depend on hawkmoths for pollination. Any threat to these insects, such as the use of insecticides, is a threat to the prairie fringed orchids.

Potential Effects and Conservation Measures: May affect, but not adversely affect. If work (including borrow sites or staging areas) is to be conducted in favorable habitat (e.g., tall-grass prairie), preconstruction surveys will be conducted before construction activities commence. If surveys result in a positive finding, consultation with USFWS will be initiated.

White Bark Pine (*Pinus albicaulis*)-Candidate

Whitebark pine is typically found in cold, windy, high elevation or high latitude sites in western North America and as a result, many stands are geographically isolated. It is a stress-tolerant pine and its hardiness allows it to grow where other conifer species cannot. Whitebark pine is considered a keystone species because it regulates runoff by slowing the progress of snowmelt, reduces soil erosion by initiating early succession after fires and other disturbances, and provides seeds that are a high-energy food source for some birds and mammals. The species is distributed in Coastal Mountain Ranges (from British Columbia, Washington, Oregon, down to east-central California) and Rocky Mountain Ranges (from northern British Columbia and Alberta to Idaho, Montana, Wyoming, and Nevada). Threats to the whitebark pine include habitat loss and mortality from white pine blister rust, mountain pine beetle, catastrophic fire and fire

suppression, environmental effects resulting from climate change, and the inadequacy of existing regulatory mechanisms.

Potential Effects and Conservation Measures: No affect. Species found in sub-alpine and alpine sites. No potential to occur in project areas of proposed levee repairs. No conservation measures identified.

Protected Fish & Wildlife Species:

American Burying Beetle (*Nicrophorus americanus*)-Endangered

The American burying beetle is a member of the carrion beetle family Silphidae and is found in only six states: Nebraska, Rhode Island, Oklahoma, South Dakota, Kansas, and Arkansas. The American burying beetle seems to be largely restricted to areas most undisturbed by human influence. Contrary to the earlier belief that the insects were associated with eastern deciduous woodlands, it now seems that carrion availability (appropriate in size as well as numbers) is more important than the type of vegetation or soil structure. Habitats in Nebraska where these beetles have been recently found consist of grassland prairie, forest edge and scrubland. Specific habitat requirements are unknown. Populations of American burying beetles have been extirpated from 90% of their original range. Reasons for decline include (1) artificial lighting that decreases populations of nocturnally active insects, (2) changing sources of carrion because of habitat alteration, (3) isolation of preferred habitat because of land use changes, (4) increased edge effect harboring more vertebrate competitors for carrion and (5) the possibility of reduced reproduction because of some genetic characteristic of the species.

Potential Effects and Conservation Measures: No affect. Species restricted to undisturbed areas. No sightings of the species found in project areas of proposed levee repairs. No conservation measures identified.

Black-Footed Ferret (*Mustela nigripes*)-Endangered

The black-footed ferret is one of the most endangered mammals in North America. The species was listed as endangered in 1967 under a precursor to the Endangered Species Act of 1973 (Volume 32 Federal Register [FR] 4001). Black-footed ferrets once ranged throughout the Great Plains. Black-footed ferret populations declined drastically in the 1900s, primarily because of the eradication of prairie dogs – their main source of food. The decrease of prairie dog numbers are a result of habitat loss, disease, and purposeful elimination because of grazing conflicts with livestock and feeding on winter wheat crops. Black-footed ferrets also rely on prairie dogs burrows for protection and cover. Current threats to black-footed ferrets also include disease, predation by golden eagles, great-horned owls, and coyotes, road kills, and trappings.

Potential Effects and Conservation Measures: No affect. Black-footed ferrets prefer locations near prairie dog towns, which are unlikely to occur in project areas of proposed levee repairs No conservation measures identified.

Bonytail chub (*Gila elegans*), Colorado Pikeminnow (*Ptychocheilus lucius*), Humpback chub (*Gila cypha*), and Razorback sucker (*Xyrauchen texanus*) – Endangered

These species are all found in the Colorado River system. Federal agency actions resulting in water depletions to the Colorado River system may affect these species and their habitat downstream in the Green and Colorado River systems. In addition, upstream depletions may contribute to the destruction or adverse modification of designated critical habitat for these four species. In general, depletions include evaporative losses and/or consumptive use of surface or groundwater within the affected basin, often characterized as diversions less return flows. Project elements that could be associated with depletions include, but are not limited to, ponds (detention/recreation/irrigation storage/stock watering), lakes (recreation/irrigation storage/municipal storage/power generation), reservoirs (recreation/irrigation storage/municipal storage/power generation), hydrostatic testing of pipelines, wells, dust abatement, diversion structures, and water treatment facilities. Any actions that may result in water depletion should be identified.

Potential Effects and Conservation Measures: No affect. It is not anticipated that any water depletions from tributaries to the Colorado River would occur affecting these species. No conservation measures identified.

Bull trout (*Salvelinus confluentus*)-Threatened

The USFWS listed the bull trout as a threatened species on November 1, 1999. The main populations of bull trout remaining in the lower 48 states are in Montana, Idaho, Oregon and Washington. Factors influencing the decline of bull trout include habitat degradation and fragmentation, the obstruction of their migratory corridors, poor water quality, the introduction of nonnative species, dams and other diversions, road construction and maintenance, and urban and rural development. The spread of exotic species, especially the northern pike released in the late 1980s and early 1990s, has profoundly impacted bull trout numbers. Bull trout spawn in the fall after temperatures drop below 48° Fahrenheit (8°C), in streams with cold, unpolluted water and clean gravel or cobble substrate. Bull trout eggs require a long incubation period (4-5 months), hatching in late winter or early spring. Fry remain in the stream bed for up to three weeks before emerging.

Potential Effects and Conservation Measures: May affect, but not likely to affect. Construction activities could result in increased sediments potentially affecting water quality, and interfering with feeding and breeding activity of the bull trout. BMPs for erosion control would be implemented to reduce erosion and prevent degradation of water quality.

Canada lynx (*Lynx Canadensis*)-Threatened

Canada lynx was listed as a Threatened species under the Endangered Species Act on March 24, 2000. Canada lynxes can be found in forested areas and make their dens underneath fallen trees, tree stumps, rock ledges or thick bushes. The Canada Lynx can be found in boreal forests all across Canada extending into western Montana, Idaho, Washington and Utah. Human alterations of forests, over-harvesting of the species, and increasing human numbers in previously untouched lynx habitat, has adversely affected its population.

Potential Effects and Conservation Measures: No affect. Species is not tolerant of human disturbance. Unlikely to occur in project areas of proposed levee repairs. No conservation measures identified.

Dakota Skipper (*Hesperia dacotae*)-Candidate

The Dakota skipper is a small butterfly with a 1-inch wingspan. Dakota skippers have four basic life stages - egg, larva, pupa, and adult. During the brief adult (flight) period in June and July, female Dakota skippers lay eggs on the underside of leaves approximately 1-2 inches above the ground. These eggs take about 10 days to hatch into larvae. Dakota skipper occurs in two types of habitat. The first is relatively flat and moist native bluestem prairie in which three species of wildflowers are usually present and in flower when Dakota skippers are in their adult (flight) stage - wood lily (*Lilium philadelphicum*), harebell (*Campanula rotundifolia*), and smooth camas (*Zygadenus elegans*). The second habitat type is upland (dry) prairie that is often on ridges and hillsides. Bluestem grasses and needlegrasses dominate these habitats and three wildflowers are typically present in high quality sites that are suitable for Dakota skipper: pale purple (*Echinacea pallida*) and upright (*E. angustifolia*) coneflowers and blanketflower (*Gaillardia sp.*). Dakota skipper populations have declined historically due to widespread conversion of native prairie for agriculture and other uses. The most significant remaining populations of Dakota skippers occur in western Minnesota, northeastern South Dakota, and north-central and southeastern North Dakota.

Potential Effects and Conservation Measures: No affect. Native bluestem prairie or upland dry prairie is unlikely to be present in or associated with project areas of proposed levee repairs. No conservation measures identified.

Desert Yellowhead (*Yermo xanthocephalus*)-Threatened

Desert yellowhead is a tap-rooted, hairless perennial herb with leafy stems to 12 inches high. Flower heads are yellow and are crowded at the top of the stem. Desert yellowhead is currently known from a single population of plants widely scattered over an area of 50 acres in Fremont County, Wyoming. The species is restricted to shallow deflation hollows in outcrops of Miocene sandstones and limestones of the Split Rock Formation at its junction with the White River Formation. In recent years, the total population has varied from about 9,000 to 13,000 individuals. Despite extensive searches, no additional populations have been located. Desert yellowhead is threatened by surface disturbances associated with recreation, oil and gas development, mineral extraction, trampling by livestock, soil compaction by vehicles, and invasive plant species.

Potential Effects and Conservation Measures: No affect. No projects are proposed in the Beaver Rim vicinity in Wyoming. No conservation measures identified.

Eastern Massasauga (*Sistrurus c. catenatus*)-Candidate

The eastern massasauga (swamp rattlesnake) ranges in size from 17 to about 40 inches in length. It is heavy-bodied, with several rows of dark brown or gray splotches down the back and sides. It

has a rattle on its tail, and it is poisonous. Massasaugas live in wet areas including wet prairies, marshes and low areas along rivers and lakes. In many areas massasaugas also use adjacent uplands during part of the year. They often hibernate in crayfish burrows but they may also be found under logs and tree roots or in small mammal burrows. Unlike other rattlesnakes, massasaugas hibernate alone. Reasons for their decline include direct eradication and from habitat loss. Draining wetlands for farms, roads, homes, and urban development has eliminated much of the massasauga habitat in many states. Also, massasaugas are not long distance travelers, so roads, towns, and farm fields prevent them from moving between the wetland and upland habitats they need. These same barriers also separate and isolate remaining populations from each other. Small, isolated populations often continue on a downward spiral until the massasauga is lost from those areas. Eastern massasaugas live in an area that extends from western New York and southern Ontario to southern Iowa and a narrow band in northeastern Missouri.

Massasaugas often show seasonal shifts in habitat use. The typical pattern is the use of wet prairie and meadow habitats in spring and fall, and activity in higher, drier, habitats in summer (Bielema 1973, Reinert and Kodrich 1982, Seigel 1986, Johnson 1995). Return to wetlands in the fall relates to selection of hypernatation sites, which are typically in areas where the soil is saturated but not inundated. Hibernation begins in mid-October to mid-April; young may enter hibernation later than adults.

Potential Effects and Conservation Measures: May affect, but not likely to adversely affect. Massasaugas prefer wet areas, such as wet prairies, marshes and low areas along rivers and lakes, and travel to adjacent uplands during part of the year. Survey would be conducted prior to construction. If surveys result in a positive find, consultation with USFWS will be initiated.

Eskimo Curlew (*Numenius borealis*)-Endangered

Eskimo curlews breed on wetlands north of the tree line, in open tundra and on tidal marshes. Preferred breeding habitats are fields, pastures, and the drier parts of salt and brackish marshes, as well as coastal beaches and vegetated dunes. During migration, populations move south and east in route to South American wintering grounds. Large-scale spring hunting in North America partially explains the species near-extinction. The main cause of decline is almost certainly the near total loss of prairies to agriculture, compounded by the suppression of prairie wildfires.

Potential Effects and Conservation Measures: No affect. There have been no current sightings of the Eskimo curlew in the project areas of proposed levee repairs, and is believed to be close to extinction. No conservation measures identified.

Gray Bat (*Myotis grisescens*)-Endangered

Gray bats live in caves year-round. During the winter, gray bats hibernate in deep, vertical caves. In the summer, they roost in caves which are scattered along rivers. These caves are in limestone karst areas of the southeastern United States. Gray bats are endangered largely because of their habit of living in very large numbers in only a few caves. As a result, they are

extremely vulnerable to disturbance. Arousing bats while they are hibernating can cause them to use up a lot of energy, which lowers their energy reserves. If a bat runs out of reserves, it may leave the cave too soon and die. In June and July, when flightless young are present, human disturbance can lead to mortality as frightened females drop their young in the panic to flee from the intruder. Many important caves were flooded and submerged by reservoirs. Other caves are in danger of natural flooding. Even if the bats escape the flood, they have difficulty finding a new cave that is suitable. The commercialization of caves drives bats away. Any gating on the cave that prevents access or alters the air flow, temperature, humidity, and amount of light is harmful.

Potential Effects and Conservation Measures: No affect. Gray bats favor caves as preferable habitat. No potential to occur in project areas of proposed levee repairs. No conservation measures identified.

Gray Wolf (*Canis lupus*)—Endangered

The gray wolf (*Canis lupus*) was historically found throughout North America, with the exception of parts of the southwestern and southeastern United States. The gray wolf was historically present in Montana, North Dakota and South Dakota, but sightings are now few in number. Reasons for decline include depletion of prey (bison, deer, elk, and moose) and eradication by farmers and ranchers to protect their livestock.

Potential Effects and Conservation Measures: No affect. There have been no sightings of the gray wolf in the project areas of the proposed levee repairs. Project areas are typically devoid of contiguous forests or suitable prey. No conservation measures identified.

Greater Sage Grouse (*Centrocercus urophasianus*)-Candidate

The Greater Sage-Grouse (*Centrocercus urophasianus*) is North America's largest grouse. This chicken-sized bird is known for male courtship displays on communal stomping grounds called "leks" where they strut and display ornate plumage for females. Sage-grouse populations have declined dramatically and the bird's range has shrunk to almost half the size of its pre-European settlement range. The U.S. Fish & Wildlife Service (USFWS) has determined that endangered species listing of Greater Sage-Grouse is warranted but precluded at this time. Currently, greater sage-grouse are found in Washington, Oregon, Idaho, Montana, North Dakota, eastern California, Nevada, Utah, western Colorado, South Dakota and Wyoming. The greater sage grouse is nearly completely reliant on sagebrush, utilizing it for roosting cover and food. These birds cannot survive in areas where sagebrush no longer exists. Mating generally begins in March, with eggs being laid from mid-March to mid-May.

Potential Effects and Conservation Measures: May affect, but not likely to adversely affect. Construction activities could potentially affect the greater sage grouse by displacement and disturbance of the species, affecting feeding, breeding and sheltering. Implementation of the following avoidance dates and protective buffers will minimize potential impacts to terrestrial wildlife. In addition, projects occurring in sage-brush habitat would require a preconstruction survey for this species. If surveys result in sightings or the potential for impacts to habitat,

consultation with the USFWS would be initiated. If during construction, the presence of leks are discovered, construction would cease and USFWS contacted. Construction activities would adhere to the following schedule:

Sage-grouse leks: 1) Avoid surface disturbance activities or occupancy within ¼-mile (0.6 in Core Areas) of the perimeter of occupied sage-grouse leks. 2) Avoid human activity between 6 p.m. and 8 a.m. from March 15-May 15 within ¼ mile of the perimeter of occupied sage-leks (0.6 in Core Areas)

Sage-grouse nesting/early brood rearing habitat: Avoid surface disturbing activities that require a special use permit in suitable sage-grouse nesting and early brood rearing habitat within 2 miles of an occupied lek or within identified sage-grouse nesting and early brood rearing habitat March 15-June 30 (all of Core Areas).

Sage-grouse winter concentration areas: Where it has been designated, avoid human activity in sage-grouse winter habitat from November 15-March 14.

Grizzly Bear (*Ursus arctos horribilis*)-Threatened

The grizzly bear was listed as a Threatened species in the lower 48 states under the Endangered Species Act on March 11, 1967. Grizzly bear populations have declined because of human-caused mortalities and habitat loss. Loss of habitat displaces bears to other areas, increasing their risks of encountering humans or human food attractants. Other impacts on grizzly bears are caused by open roads and an associated increase in poaching and accidental hunter harvests. Bears will use road areas, but their level of avoidance increases with higher levels of traffic. Grizzly bear distribution is primarily within but not limited to the Yellowstone area in northwest Wyoming, eastern Idaho, and southwest Montana; the Northern Continental Divide Ecosystem of north central Montana; the North Cascades area of north central Washington; the Selkirk Mountains area of northern Idaho, northeast Washington, and southeast British Columbia; and in the Bitterroot Mountains of east central Idaho and western Montana; however, this area does not contain any grizzly bears at this time.

Potential Effects and Conservation Measures: No affect. Project areas are typically out of the range of preferred habitat, although grizzly bears will utilize road areas. Unlikely grizzly bears would be found in the project areas of proposed levee repairs. If a grizzly bear is sighted, construction crews need to use extreme caution. No conservation measures identified.

Higgins Eye Pearly Mussel (*Lampsilis higginsii*)-Endangered

The Higgins eye is a freshwater mussel of larger rivers usually found in areas with deep water and moderate currents. The animals bury themselves in the sand and gravel river bottoms with just the edge of their partially-opened shells exposed. The river's currents flow over the mussels as they siphon water for microorganisms such as algae and bacteria, which they use as food. The role of Higgins' eye pearly mussels in the natural river ecosystems is as a food source for wildlife like muskrats, otters, and raccoons and as a filter which improves water quality. Higgins eye pearly mussels depend on deep, free-flowing rivers with clean water. Much of their historic

habitat was changed from free-flowing river systems to impounded river systems. This resulted in different water flow patterns, substrate characteristics, and host fish habitat and movement which affect how the Higgins eye feed, live, and reproduce. Municipal, industrial, and farm runoff degrade water quality. As a filter-feeder, this species concentrates chemicals and toxic metals in body tissues and can be poisoned by such chemicals in the water. Dredging and waterway traffic produce siltation which cover the substrate and mussel beds. The invasive zebra mussel is the greatest known threat to Higgins eye. This small mussel is less than 2 inches in length, but tens of thousands can colonize a square meter area. They attach to any hard surface, including shells of other mussels. They compete for food with native species and, when attached to the shells, prevent normal travel, burrowing, and opening and closing of the shells. Mussel spawning and glochidial release periods occur in spring and summer, and glochidia are obligate parasites on the gills or fins of specific fish hosts. After metamorphose and release, if on suitable substrate, they become free living juveniles on the river bottom.

Potential Effects and Conservation Measures: No affect. The Higgins eye pearly mussel is found in the Rock River in Iowa and the Mississippi River in Missouri. As such, this species is not likely to occur in the project areas of the proposed levee repairs. No conservation measures identified.

Hine's Emerald Dragonfly (*Somatochlora hineana*)-Endangered

Historically, the Hine's emerald dragonfly was found in Alabama, Indiana, and Ohio and probably has been extirpated in those states. Today the dragonfly can only be found in Illinois, Michigan, Missouri and Wisconsin. The Hine's emerald dragonfly lives in calcareous (high in calcium carbonate) spring-fed marshes and sedge meadows overlaying dolomite bedrock. The greatest threat to the Hine's emerald dragonfly is habitat destruction. Most of the wetland habitat that this dragonfly depends on for survival has been drained and filled to make way for urban and industrial development. Contamination of wetlands by pesticides or other pollutants also poses a threat. The dragonfly depends on pristine wetland or stream areas, with good water quality, for growth and development. Development that decreases the amount or quality of ground water flowing to the dragonfly's habitat threatens its survival because it depends on spring-fed shallow water to breed.

Potential Effects and Conservation Measures: No affect. The Hine's emerald dragonfly preferred habitat is spring-fed marshes and sedge meadows. This species is unlikely to occur in the proposed areas of levee repairs. No conservation measures identified.

Indiana Bat (*Myotis sodalist*)-Endangered

Indiana bats hibernate during winter in caves or, occasionally, in abandoned mines. For hibernation, they require cool, humid caves with stable temperatures, under 50° F but above freezing. Very few caves within the range of the species have these conditions. After hibernation, Indiana bats migrate to their summer habitat in wooded areas where they usually roost under loose tree bark on dead or dying trees. During summer, males roost alone or in small groups, while females roost in larger groups of up to 100 bats or more. Indiana bats also forage in or along the edges of forested areas. Indiana bats, because they hibernate in large numbers in

only a few caves, are extremely vulnerable to disturbance. Since the largest hibernation caves support from 20,000 to 50,000 bats, it is easy to see how a large part of the total population can be affected by a single event. Episodes of large numbers of Indiana bat deaths have occurred due to human disturbance during hibernation. The commercialization of caves, allowing visitors to tour caves during hibernation, drives bats away. Changes in the structure of caves, such as blocking an entrance, can change the temperature in a cave. A change of even a few degrees can make a cave unsuitable for hibernating bats. Some caves are fitted with gates to keep people out, but improper gating that prevents access by bats or alters air flow, temperature, or humidity can also be harmful. Indiana bats use trees as roosting and foraging sites during summer months. Loss and fragmentation of forested habitats can affect bat populations. Insect-eating bats may seem to have an unlimited food supply, but in local areas, insects may not be plentiful because of pesticide use. This can also affect the quality of the bats' food supply. Bats may be affected by eating contaminated insects, drinking contaminated water, or absorbing the chemicals while feeding in areas that have been recently treated.

Potential Effects and Conservation Measures: May affect, but not likely to adversely affect. Summer construction could potentially displace the Indiana bat from its roosting habitat, typically trees with exfoliating bark. Areas with potential habitat would be avoided to the extent feasible. Surveys would be conducted for potential habitat before construction activities begin. If surveys result in a positive finding, consultation with USFWS would be initiated. If during construction, the Indiana bat is discovered, construction would cease immediately and USFWS contacted.

Iowa Pleistocene Snail (*Discus macclintocki*)-Endangered

The snails live in the leaf litter of special cool and moist hillsides called algific talus slopes. Cool air and water, from underground ice, flow out of cracks in the slopes and keep the ground temperatures below 50 degrees Fahrenheit (F) in summer and above 14 degrees F in winter. The major long-term cause of snail population decline is climate change. The most immediate habitat threats are from logging, quarrying, road building, sinkhole filling and contamination, human foot traffic, livestock grazing and trampling, and misapplication of pesticides.

Potential Effects and Conservation Measures: No affect. The Iowa pleistocene snails preferred habitat is cool and moist hillsides. This species is unlikely to occur in the proposed areas of levee repairs. No conservation measures identified.

Least Tern (*Sterna antillarum*)-Endangered

Least terns are colonial water birds that occupy coastal beaches and barren to sparsely vegetated sandbars along rivers, sand and gravel pits or lake and reservoir shorelines for nesting and chick rearing, which occurs from late April through August. Least tern uses several major river systems of the United States including the Missouri River during the breeding season. Stabilization for navigation, flood control, hydropower generation, and irrigation has led to a loss of much of the sandbar habitat the species requires and led to the degradation of the remaining habitat. The species is present in each of the Mainstem reservoirs except Lake Sharpe and downstream reaches. In the Missouri River from Gavins Point Dam to the mouth, pallid sturgeon

have been captured in the lower portions of many of the tributaries, such as the James, Big Sioux, Platte, Kansas, Gasconade, and the Osage. Recent research and monitoring by non-Corps entities on the lower Platte River has documented numerous pallid sturgeon using this river, many of which were originally stocked into the lower Missouri River. Least terns use several of the Missouri River tributaries in the northern Great Plains. According to the 2005 “Distribution and Abundance of the Interior Population of the Least Tern (*Sternula antillarum*)”, least terns were counted on the following Missouri River tributaries: Yellowstone River MT – 16 adults, Cheyenne River SD – 4 adults, Niobrara River NE – 289 adults, Loup River NE (sandpits included) – 87 adults, Elkhorn River NE (sandpits included) 74 adults, Platte River NE (reservoir and sandpits included) – 588 adults and the Kansas River KS – 13 adults (Pavelka, pers.comm.)

Potential Effects and Conservation Measures: May affect / Not likely to adversely affect. Most of the work is anticipated to occur either before or after the birds utilize affected shorelines or sandbars (April-August); however, project construction could occur during various seasons depending on prioritization of repairs. If work would occur during the nesting season, and be within the vicinity of nests (e.g. within a 2,640 ft buffer identified in the ESH PEIS, USACE 2011), work would be closely coordinated with Corps Project, and Threatened and Endangered Species Section staff, and the USFWS. If the least tern should initiate nesting in the vicinity of the levee repair, work would stop and the USFWS would be contacted. If construction or mobilization were required during the nesting season and in areas of known nests or fledglings (2,640 ft) consultation with USFWS would be conducted.

Mountain Plover (*Charadrius montanus*)-Proposed

Mountain plover is the endemic plover of the short grass prairie. About the size of a killdeer, the mountain plover averages 7-1/2 inches in length, with yellow to flesh-colored legs, and a short, fairly thick bill. During the breeding season, the mountain plover has a distinct black cap and a thin black line between the eye and the bill. Mountain plovers lack the black breast bands common to other plovers. The diet of this neotropical migrant is 95% insects. Hunting probably explains the long-term decline of the species. More recently, cultivation and urbanization have reduced nesting habitat, and intensive grazing has resulted in desertification and a reduced prey base. Large declines in grazing species, especially bison and prairie dogs, have resulted in unsuitable habitat succession. Over 70% of nests on cultivated land are destroyed by farm machinery.

Potential Effects and Conservation Measures: No affect. The mountain plovers preferred habitat is short-grass prairie. This species or habitat is unlikely to occur in the proposed areas of levee repairs. No conservation measures identified.

North American Wolverine (*Gulo gulo luscus*)-Candidate

Wolverine habitat consists entirely of alpine, arctic, and sub-arctic regions. Snow cover during the spring is essential for females who use deep snow banks for dens throughout the pregnancy and weaning periods. Habitat areas for wolverines are usually isolated and described as “patchy,” often separated by large areas of unsuitable habitat. Almost all wolverine habitat in the contiguous U.S. is federally owned and managed. There is potential for wolverines from the

Rocky Mountain population to enter Oregon from Idaho, Wyoming, or Montana. The greatest cause of decline of the North American wolverine is habitat loss due to trapping, road building, logging, and habitat fragmentation. Areas with human development and recreational activity, such as skiing, may have disturbed wolverines in otherwise suitable habitat. Transportation corridors and infrastructure development may have created substantial barriers to immigration between suitable habitats, limiting the range and connectivity of sub-populations of wolverine. Inbreeding and loss of genetic diversity make the already small populations of wolverines more susceptible to high mortality.

Potential Effects and Conservation Measures: No affect. The North American wolverine avoids areas of human disturbance. Unlikely that this species would be found in the project areas of proposed levee repairs. No conservation measures identified.

Pallid Sturgeon (*Scaphirynchus albus*)-Endangered

The pallid sturgeon, other sturgeon species, and the paddlefish are the only living descendants of an ancient group of Paleozoic fishes (USACE, 2008). The pallid sturgeon was listed as an endangered species in 1990 primarily due to the loss of habitat from alterations to the Missouri River and the construction of the extensive system of dams in the upper reaches (USACE, 2007). Commercial fishing may have also played a role in the pallid sturgeon's decline (USACE, 2007). These species are adapted to large, turbid, warm-water rivers.

Within the Missouri River basin, very few wild pallid sturgeons exist; and exact numbers are not known (USFWS, 2010). Pallid sturgeon can be found in the upper reaches of Fort Peck Lake and in the 250 miles of river between the lake and Canyon Ferry Dam near Helena, Montana. They have also been found in the Dredge Cuts downstream of the dam (USACE, 2008). Population estimates are only available for existing pallid populations in a few reaches of the Missouri River. Approximately 35 adults are believed to exist in the Missouri River above Fort Peck Lake. About 180 adults are estimated to exist between the Fort Peck Dam and Lake Sakakawea, including the Yellowstone River up to approximately river mile 71. Since 1997 over 57,000 and 110,000 pallid sturgeon have been stocked (quantified as yearly equivalents) into the Missouri River upstream of Fort Peck Reservoir and downstream of Fort Peck Dam in the Missouri and Yellowstone rivers [Pallid Sturgeon Recovery Priority Management Areas (RPMA) 1 & 2], respectively. A similar situation exists below Gavins Point Dam in RPMA 4 (Gavins Point Dam to the Missouri River mouth) with over 67,000 pallid sturgeon stocked (quantified as yearly equivalents) into the Missouri River since 1992. High survival rates (Hadley and Rotella, 2009; Steffensen et al., 2010) have likely led to thousands of juvenile pallid sturgeon inhabiting these areas (Welker, pers. comm.). A remnant population also exists in Lake Sharpe in South Dakota, but a reliable population estimate is not available. Between Fort Randall Dam and Gavins Point Dam, the wild population is believed to be nearly zero, although a wild pallid sturgeon was captured in this reach in November 2006 during standard Pallid Sturgeon Population Assessment sampling activities by the USFWS. From Gavins Point Dam to the mouth of the Missouri River, current data are inadequate for a reliable population estimate; however, the majority of pallid sturgeon captures are the result of stocking efforts since 2002.

Potential Effects and Conservation Measures: May affect, but not likely to adversely affect. BMP's would be implemented to reduce terrestrial erosion. If construction requires temporary reduction in flows, consultation with the USFWS would be conducted. Dredging could directly affect adult and juvenile pallid sturgeon through entrainment in the dredge, encounters with boat propellers, or noise disturbance. If dredging is needed, this activity would be scheduled to occur outside of the spawning period for the pallid sturgeon. In the 2003 amendment to the U.S. Fish and Wildlife Service's Biological Opinion for operations on the Missouri River, the USFWS determined that side channel and backwater dredging disturbance for purposes of establishing SWH is not likely to result in jeopardy to the species and the effect would largely be offset by the resulting SWH creation/restoration. Dredging could also disturb the normal feeding and sheltering habits of pallid sturgeon through dredging noise (USACE 2011). Underwater human-caused noise has been documented to influence fish behavior in general (Nightingale and Simenstad 2001). It is expected that noise from the operation of dredges may result in avoidance of the dredging area by fish species sensitive to noise over the duration of the activity. Adult pallid sturgeon have been observed using radio telemetry near dredge boats (DeLonay pers. comm.) and it was suggested that this species may not be particularly sensitive to dredging noise. Thus, it is believed that noise produced by dredging would not interfere with pallid sturgeons' normal feeding and sheltering, and would not adversely affect the species.

While dredging for this project will deposit materials into the new levee alignment and not side cast it back into the river, it is still anticipated that the dredging operation would result in some temporary, localized elevation of suspended sediments caused by the cutter head of the dredge. The changes in suspended sediments from dredging are not anticipated to differ substantially from naturally occurring levels.

Pink Mucket Mussel (*Lampsilis orbiculata*)-Endangered

This mussel is found in mud and sand, in shallow riffles and shoals swept free of silt in major rivers and tributaries. This mussel buries itself in sand or gravel, with only the edge of its shell and its feeding siphons exposed. Dams and reservoirs have flooded most of this mussel's habitat, reducing its gravel and sand habitat and probably affecting the distribution of its fish hosts. Impoundments are fatal to most riverine mussels. Erosion caused by strip mining, logging and farming adds silt to many rivers, which can clog the mussel's feeding siphons and even bury it completely. Other threats include pollution from agricultural and industrial runoff. These chemicals and toxic metals become concentrated in the body tissues, eventually poisoning it to death. Mussel spawning and glochidial release periods occur in spring and summer, and glochidia are obligate parasites on the gills or fins of specific fish hosts. After metamorphose and release, if on suitable substrate, they become free living juveniles on the river bottom.

Potential Effects and Conservation Measures: May affect, but not likely to adversely affect. An increase in turbidity caused by construction activities could clog the species feeding siphons or directly bury it. BMP's would be used to reduce erosion and associated turbidity. Work in the main channel would be avoided. Surveys would be conducted if work occurs in a stream known to be inhabited by mussels or a concentrated population is suspected in the area. Surveys would be coordinated with the USFWS, along with appropriated mitigation efforts if discovered.

Piping Plover (*Charadrius melodus*)-Threatened

The piping plover is a shorebird that favors coastal beaches, alkali wetlands, lakeshores, reservoir beaches and river sandbars for nesting and chick rearing, and utilizes the Missouri River and shorelines of many of the Corps Project reservoirs. Nesting and chick rearing occurs from April to August. In 1985, the USFWS listed the Northern Great Plains population as threatened). The USFWS designated critical habitat for the Northern Great Plains population of the piping plover, including the Missouri River, in September 2002. This designation includes 183,422 acres of habitat and 1,207.5 river miles in Minnesota, Montana, North Dakota, South Dakota, and Nebraska. Designated areas of critical habitat include prairie alkali wetlands and surrounding shoreline; river channels and associated sandbars and islands; and reservoirs and inland lakes and their sparsely vegetated shorelines, peninsulas, and islands. All of the Missouri River tributaries used by piping plovers are located in Nebraska. According to the 2006 International Piping Plover Adult Census 497 piping plovers were counted along reservoirs, sandpits and sandbars associated with the Platte and North Platte Rivers, 204 were counted along the Niobrara River, 31 were counted along the Loup and North Loup Rivers and 17 were counted along the Elkhorn River (Pavelka, pers. comm.).

Potential Effects and Conservation Measures: May affect, but not likely to adversely affect. Work would be scheduled to occur outside of the nesting/breeding season (April-August) for piping plovers. If construction were required during the nesting season and in areas of known nests, fledglings, or newly created riverwash areas (½ mile), consultation with USFWS would be initiated. If plovers are discovered during construction activities, work would immediately cease and USFWS would be contacted.

Rabbitsfoot Mussel (*Quadrula cylindrical*)-Candidate

The rabbitsfoot is a medium to large-sized mussel that reaches about six inches in length. The rabbitsfoot is primarily an inhabitant of small to medium-sized streams and some larger rivers. It usually occurs in shallow areas along the bank and adjacent runs and shoals where the water velocity is reduced. Specimens may also occupy deep water runs, having been reported in 9-12 feet of water. Bottom substrates generally include sand and gravel. This species seldom burrows but lies on its side. Threats to the species include destruction, modification or curtailment of its habitat; water quality degradation; sediment quality degradation; and reduced health of host fish. An emerging concern/threat is waterborne (and potentially sediment) toxicant exposure to chemicals that act directly on the neuroendocrine pathways controlling reproduction, which can cause premature release of viable or nonviable glochidia. Pharmaceutical chemicals used in commonly consumed drugs are increasingly found in surface waters. Mussel spawning and glochidial release periods occur in spring and summer, and glochidia are obligate parasites on the gills or fins of specific fish hosts. After metamorphose and release, if on suitable substrate, they become free living juveniles on the river bottom.

Potential Effects and Conservation Measures: May affect, but not likely to adversely affect. Turbidity from construction may clog the species feeding siphons or directly bury it. BMPs would be implemented to reduce erosion. Spawning and glochidial release periods occur in

spring and summer and construction activities would be avoided to the extent possible during this time. Work within the river channel would be avoided. If a concentrated population is suspected in the area, potential for preconstruction surveys would be coordinated with the USFWS, along with appropriated mitigation efforts if discovered.

Salt Creek Tiger Beetle (*Cicindela nevadica lincolniana*)-Endangered

The Salt Creek tiger beetle is confined to eastern Nebraska saline wetlands and associated streams and tributaries of Salt Creek in the northern third of Lancaster County. The insect is believed to have disappeared from the southern margin of Saunders Counties. It is found along mud banks of streams and seeps, and in association with saline wetlands and exposed mud flats of saline wetlands. Four areas have been designated as critical habitat and include (1) Upper Little Salt Creek North in Lancaster County, (2) Little Salt Creek – Arbor Lake in Lancaster County, (3) Little Salt Creek – Roper in Lancaster County, and (4) Rock Creek – Jack Sinn Wildlife Management Area in Lancaster and Saunders Counties. Saline wetland and stream complexes found along Little Salt Creek and Rock Creek comprise the critical habitat designation. The primary reason for its decline includes its need for a very specific habitat which now has become limiting.

Potential Effects and Conservation Measures: No affect. The Salt Creek tiger beetle is mainly found in Lancaster and Saunders counties. This species requires mud and saline wetlands. Unlikely that suitable habitat is found in project areas of proposed levee repairs. No conservation measures identified.

Scaleshell Mussel (*Leptodea leptodon*)-Endangered

Scaleshells historically occurred across most of the eastern United States. During the last 50 years this species became increasingly rare within a reduced range. Of the 55 historical populations, 14 remain scattered within the Mississippi River basin in Arkansas, Missouri, and Oklahoma. Scaleshell live in medium-sized and large rivers with stable channels and good water quality. They bury themselves in sand and gravel on the bottom with only the edge of their partially-opened shells exposed. The roles of scaleshell in river ecosystems are as food for wildlife like muskrats, otters, and raccoons and as filters which improve water quality. Adult mussels are easily harmed by toxins and declines in water quality from pollution. Pollution may come from specific, identifiable sources such as factories, sewage treatment plants and solid waste disposal sites or from diffuse sources like runoff from cultivated fields, pastures, cattle feedlots, poultry farms, mines, construction sites, private wastewater discharges, and road drainage. Contaminants reduce water quality and may directly kill mussels, reduce the ability of surviving mussels to have young, or result in poor health or disappearance of host fish. Sediment is material suspended in water that usually is moved as the result of erosion. Although sedimentation is a natural process, poor land use practices, dredging, impoundments, intensive timber harvesting, heavy recreational use, and other activities may accelerate erosion and increase sedimentation. A sudden or slow blanketing of the river bottom with sediment can suffocate freshwater mussels because it is difficult for them to move away from the threat. Increased sediment levels may also make it difficult for scaleshells to feed, which can lead to decreased growth, reproduction, and survival. Dams affect both upstream and downstream

mussel populations by disrupting natural flow patterns, scouring river bottoms, changing water temperatures, and eliminating habitat.

The scaleshell, a mussel adapted to living in river currents, cannot survive in the still water impounded behind dams. Mussel spawning and glochidial release periods occur in spring and summer, and glochidia are obligate parasites on the gills or fins of specific fish hosts. After metamorphose and release, if on suitable substrate, they become free living juveniles on the river bottom. Scaleshells depend on their host fish as a means of moving upstream. Because dams are barriers that prevent fish from moving upstream they also prevent mussels from moving upstream. Upstream mussel populations then become isolated from downstream populations. This isolation leads to small unstable populations which are more likely to die out. The invasion of the exotic zebra mussel into the US poses a substantial threat, because it starves and suffocates native mussels by attaching to their shells in large numbers.

Potential Effects and Conservation Measures: May affect, but not likely to adversely affect. Turbidity from construction may clog the species feeding siphons or directly bury it. BMPs would be implemented to reduce erosion. Spawning and glochidial release periods occur in spring and summer and construction activities would be avoided to the extent possible during this time. Work within the river channel would be avoided. If a concentrated population is suspected in the area, potential for preconstruction surveys would be coordinated with the USFWS, along with appropriated mitigation efforts if discovered.

Sheep-Nose Mussel (*Plethobasus cyphus*)-Proposed

The sheepsnose is found across the Midwest and Southeast. However, it has been eliminated from two-thirds of the total number of streams from which it was historically known. The sheepsnose is currently found in Alabama, Illinois, Indiana, Iowa, Kentucky, Minnesota, Mississippi, Missouri, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia, and Wisconsin. Dams affect both upstream and downstream mussel populations by disrupting natural river flow patterns, scouring river bottoms, changing water temperatures, and eliminating habitat. Large rivers throughout most of the sheepsnose mussel's range have been impounded; leaving short, isolated patches of habitat below dams. Mussel spawning and glochidial release periods occur in spring and summer, and glochidia are obligate parasites on the gills or fins of specific fish hosts. After metamorphose and release, if on suitable substrate, they become free living juveniles on the river bottom. The sheepsnose also depends on host fish to move upstream. Because dams block fish passage, mussels are also prevented from moving upstream, which isolates upstream from downstream populations, leading to small, unstable populations, which are more likely to die out. Poor land use practices, dredging, intensive timber harvests, road construction, and other activities may accelerate erosion and increase sedimentation. Sedimentation that results in blanketing a river bottom may suffocate mussels because they cannot move fast enough to avoid the impact. Also, increased sedimentation reduces the ability of mussels to remove food and oxygen from the water, which can lead to decreased growth, reproduction, and survival. Adult mussels are easily harmed by toxins and degraded water quality from pollution because they are sedentary (they tend to stay in one place). Pollution may come from specific, identifiable sources such as accidental spills, factory discharges, sewage treatment plants, and solid waste

disposal sites. Pollution also comes from diffuse sources like runoff from fields, feedlots, mines, construction sites, private wastewater discharges, and roads. Contaminants may directly kill mussels, but they may also indirectly harm sheepnose by reducing water quality, which reduces survival and reproduction, and lowers the numbers of host fish. Dredging and channelization have profoundly changed rivers nationwide. Channelization physically alters rivers by accelerating erosion, reducing depths, decreasing habitat diversity, destabilizing stream bottoms, and removing riparian vegetation. Most populations of sheepnose are small and geographically isolated. These small populations, which live in short sections of rivers, are susceptible to extirpation from single catastrophic events, such as toxic spills. Also, isolation makes natural repopulation impossible without human assistance. The invasion of the nonnative zebra mussel into the United States poses a serious threat. Zebra mussels proliferate to such an extent that they deplete food resources and they attach to native mussel shells in such large numbers that the native mussel cannot open its shell to eat or breath.

Potential Effects and Conservation Measures: May affect, but not likely to adversely affect. Turbidity from construction may clog the species feeding siphons or directly bury it. BMPs would be implemented to reduce erosion. Spawning and glochidial release periods occur in spring and summer and construction activities would be avoided to the extent possible during this time. Work within the river channel would be avoided. If a concentrated population is suspected in the area, potential for preconstruction surveys would be coordinated with the USFWS, along with appropriated mitigation efforts if discovered.

Spectaclecase Mussel (*Cumberlandia monodonta*)-Proposed

The spectaclecase is a large mussel that can grow to at least 9 inches in length. The shape of the shell is elongated, sometimes curved, and somewhat inflated. Its current range includes Alabama, Arkansas, Illinois, Iowa, Kentucky, Minnesota, Missouri, Tennessee, Virginia, West Virginia, and Wisconsin. With few exceptions, spectaclecase populations are highly fragmented and restricted to short stream reaches. Population losses due to impoundments have contributed more to the decline and imperilment of the spectaclecase than any other factor. Dams affect both upstream and downstream populations by disrupting natural river flow patterns, scouring river bottoms, changing water temperatures, and eliminating habitat. Large rivers throughout nearly all of the spectaclecase mussel's range have been impounded, leaving short, isolated patches of habitat below dams. Mussel spawning and glochidial release periods occur in spring and summer, and glochidia are obligate parasites on the gills or fins of specific fish hosts. After metamorphose and release, if on suitable substrate, they become free living juveniles on the river bottom. Spectaclecase mussels depend on a fish species, or other aquatic species, to move upstream. Because dams block fish passage, mussels are also prevented from moving upstream. This isolates upstream populations from those downstream, leading to small, unstable populations, which are more likely to die out. Poor land use practices, dredging, intensive timber harvests, highway construction, and other activities may accelerate erosion and increase sedimentation. Sedimentation that results in blanketing a river bottom may suffocate mussels because they cannot move fast enough to avoid the impact. Also, increased sedimentation reduces the ability of mussels to remove food and oxygen from the water column, which can lead to decreased growth, reproduction, and survival. Adult mussels are easily harmed by toxins and

degraded water quality from pollution because they are sedentary (they tend to stay in one place). Pollution may come from specific, identifiable sources such as accidental spills, factory discharges, sewage treatment plants, and solid waste disposal sites or from diffuse sources like runoff from fields, feedlots, mines, construction sites, private wastewater discharges, and roads. Contaminants may directly kill mussels, but they may also indirectly harm spectaclecase by reducing water quality, affecting the ability of surviving mussels to reproduce, and lowering the numbers of host fish. Dredging and channelization have profoundly altered riverine habitats nationwide. Channelization physically changes streams by accelerating erosion, reducing depths, decreasing habitat diversity, destabilizing stream bottoms, and removing riparian vegetation. Most of the remaining populations of the spectaclecase are small and geographically isolated. These small populations remaining in short sections of rivers are susceptible to extirpation from single catastrophic events, such as a toxic spill. Also, this level of isolation makes natural repopulation of any extirpated population impossible without human intervention. The invasion of the nonnative zebra mussel into the United States poses a serious threat. Zebra mussels proliferate in such high numbers that they use up food resources and attach to native mussel shells in such large numbers that the native mussel cannot open its shell to eat or breath.

Potential Effects and Conservation Measures: May affect, but not likely to adversely affect. Turbidity from construction may clog the species feeding siphons or directly bury it. BMPs would be implemented to reduce erosion. Spawning and glochidial release periods occur in spring and summer and construction activities would be avoided to the extent possible during this time. Work within the river channel would be avoided. If a concentrated population is suspected in the area, potential for preconstruction surveys would be coordinated with the USFWS, along with appropriated mitigation efforts if discovered.

Sprague's Pipit (*Anthus spragueii*)-Candidate

Sprague's pipit breeds in grasslands of south-east Alberta, southern Saskatchewan, south-west Manitoba and occasionally southern British Columbia, Canada, and in north and central Montana, North Dakota, and locally South Dakota, casually to north-west Minnesota, USA. The bird winters throughout the southern USA and northern Mexico. Conversion of prairie to seeded pasture, hayfields and cropland, and inappropriate grazing are responsible for habitat loss, degradation of remaining grassland and rapid declines in population. The large-scale introduction of Eurasian plant species and their subsequent invasion of native prairie have reduced breeding densities. Grazing and burning can have positive or negative impacts on suitable habitat depending on moisture, soil-types, plant species, intensity and frequency. Nests are destroyed by haying prior to the fledging period. Virtual cessation of burning in the breeding zone and intensive grazing in the wintering zone has led to encroachment by shrubs and trees, and the preferred short prairie grass has diminished.

Potential Effects and Conservation Measures: No Affect. The Sprague's pipit avoids cultivated areas and is unlikely to inhabit the project areas of the proposed levee repairs. No conservation measures identified.

Topeka Shiner (*Notropis topeka*)-Federally Endangered

The Topeka shiner is a small fish found in prairie streams in Iowa, Kansas, Minnesota, Missouri, and South Dakota. Spawning behavior is poorly understood for this species; however, it is thought that Topeka shiners spawn on silt-free substrates found in the quieter waters of stream pools from late May to mid-July. Topeka shiners inhabit a variety of high-quality prairie streams, but they are intolerant of certain human-caused disturbances and habitat alterations. For example, streams that have been channelized or impounded or that drain cultivated fields generally are not suitable habitat. It still occurs in all six states in its historical range but is now restricted to small areas in Kansas, Missouri, Iowa, Nebraska, South Dakota, and Minnesota, with most of the remaining populations existing in Kansas. In South Dakota, the Topeka shiner was formerly common in the Big Sioux, Vermillion, and James River drainages and still persists there but in low numbers. In Nebraska, Topeka shiners persist in the upper Loup River drainage (Cherry County) and in the Elkhorn River basin (Madison County). Topeka shiners have been adversely impacted by degradation of stream quality, habitat destruction, siltation, channelization, dewatering of streams, and water impoundment. Population declines also are attributed to introduce predaceous fishes.

Potential Effects and Conservation Measures: May affect, but not likely to adversely affect. Turbidity from construction activities may affect feeding and breeding for this species. BMPs would be implemented to reduce erosion. Construction activities during the spawning period would be avoided to the extent possible. If construction cannot be avoided, preconstruction surveys would be coordinated with the USFWS, along with appropriated mitigation efforts if discovered.

Warm Spring Zaitzevian Riffle Beetle (*Zaitzevia thermae*)-Candidate

The warm spring Zaitzevian beetle requires surface flowing warm water with temperatures between 60-84 degrees F. It is commonly found securely attached under rocks or clinging to watercress (Kindschi 1994). These beetles feed on small pieces of algae and diatoms that they scrape from submerged rocks on the gravel bottom and among vegetation. They are endemic to Bridger Creek Warm Springs near Bozeman, Montana. The destruction of this beetle's habitat has been its number one reason for decline.

Potential Effects and Conservation Measures: No affect. The Zaitzevian riffle beetle is found only in Gallatin County Montana. The habitat, which is approximately thirty-five square meters, is owned by the federal government and lies on the Fish Technology Center property. No project levee repairs are proposed in this area. No conservation measures identified.

Whooping Crane (*Grus americanus*)-Endangered

The whooping crane was listed as endangered in 1967 under a precursor to the Endangered Species Act of 1973 (Volume 32 Federal Register [FR] 4001). Unregulated hunting for sport and food combined with the loss of large expanses of wetlands habitat caused the massive decrease in numbers of whooping cranes. The whooping crane is found only in North America. Breeding populations of the crane were extirpated from the U.S. portion of its historic breeding range by the early 1900's. Because of intense conservation efforts and captive breeding programs, the whooping crane population now numbers more than 450 individuals. The

whooping crane migrates during the spring (late April to mid-June) and the fall (late September to mid-October). Whooping cranes use open sand and gravel bars or very shallow water in rivers and lakes for nightly roosting. Cranes seen feeding during the migration are frequently within short flight distances of reservoirs, lakes, and large rivers that offer bare islands for nightly roosting. Whooping cranes can tolerate very little human disturbance, especially during nesting, brood rearing, and during flightless molt (May to mid-August). Slight human disturbance is often sufficient to cause adults to desert nests (USGS, 2005). A human on foot at a distance of over 1/4 mile can quickly put a whooping crane to flight. Pairs usually mate for life and return to the same nest site each year. Whooping cranes generally lay two eggs, 2 days apart, in late April or early May. Whooping cranes fledge between 78 and 90 days (Tesky, 1993). Most whooping crane sightings in North and South Dakota and Nebraska occur in the western two-thirds of the state, while the cranes are migrating from their winter home. The migration period in Nebraska is approximately March 23 through May 10 and from September 16 through November 16, but most sightings are near the Platte River, where a portion of the river from Lexington to Shelton, Nebraska has been federally listed as critical habitat for whooping cranes (USGS, 2006).

Potential Effects and Conservation Measures: May affect, but not likely to adversely affect. Migrating cranes make frequent stops to feed and rest during migration and could potentially stopover along banks and sandbars within the project areas. Construction related activities may harass the species and restrictions may be placed on the timing of construction during migration season (April to May and September to November). Preconstruction surveys would be coordinated with the USFWS, along with appropriated mitigation efforts if whooping cranes are found to be present with the project vicinity.

Yellow-billed Cuckoo (*Coccyzus americanus*)-Candidate

The yellow-billed cuckoo was petitioned for listing under the Endangered Species Act on July 18, 2001. The principal causes for the proposed listing include riparian habitat loss, dams and river flow management that have altered river conditions, stream channelization and stabilization. Available breeding habitats for yellow-billed cuckoos have also been substantially reduced in area and quality by groundwater pumping and the replacement of native riparian habitats by invasive non-native plants, particularly tamarisk. Migrants and breeders can be found in moderately dense thickets preferably near water, second-growth woodlands, abandoned farmsteads that are overgrown with shrubs and bushes, and brushy orchards. Cottonwoods and willows that form open woodlands with dense, low vegetation are particularly preferred. These cuckoos are generally absent from large, urban areas and dense forests, although they will use both of these habitats in central North America. Yellow-billed cuckoos reach sexual maturity in the spring. Nesting season lasts from mid-April through mid-September, peaking in May. Populations of yellow-billed cuckoos have severely declined throughout their range, especially in western states (Wiggins, 2005). They are more commonly found in the eastern states (NE, IA, MO, SD) as a spring and fall migrant and summer resident. Little to no information regarding yellow-billed cuckoo migratory patterns exists for Montana. Of the few records containing any details on the months of observation (many of them are historic records with limited detail), the yellow-billed cuckoo is known in Montana only in June and July (Montana Bird Distribution Online Database, 2001). All of these observations indicate no behavioral evidence to suggest

breeding. Wyoming is on the periphery of the yellow-billed cuckoos range, occurring mainly along the Bighorn, Powder, Laramie, Cheyenne, and North Platt River drainages. Because of its decline in the western states, the distinct population segment of the yellow-billed cuckoo west of the Continental Divide is a candidate for listing under the ESA.

Potential Effects and Conservation Measures: May affect, but not likely to adversely affect. The yellow-billed cuckoo prefers woody, shrubby vegetation not usually found on levees. Surveys would be conducted prior to construction and before any vegetation removal or tree clearing takes place if during primary nesting season. If surveys result in a positive finding, consultation with USFWS will be initiated. If during construction the yellow-billed cuckoo is found to be present, construction will cease immediately and the USFWS consulted.

Determination of Affects: Table 2 summarizes the USACE's determination of affects resulting from the proposed projects and provides mitigation measures for each species to reduce impacts, as required. "No effect" means there will be no impacts, positive or negative, to listed or proposed resources. Generally, this means no listed resources will be exposed to action and its environmental consequences. Concurrence from the USFWS would not be required. "May affect, but not likely to adversely affect" means that all effects are beneficial, insignificant, or discountable. These determinations require written concurrence from the USFWS. "May affect, and is likely to adversely affect" means that listed resources are likely to be exposed to the action or its environmental consequences and will respond in a negative manner to the exposure.

Table 2: Biological Assessment Summary for Federally-listed and Candidate Endangered and Threatened Species

Common Name (Status)	State Location Potential Affect	Determination	Mitigation
American Burying Beetle (Endangered)	MO and NE. The beetles are restricted to undisturbed areas. There have been no known sightings of the beetle at proposed project sites.	No Affect	None
Black-Footed Ferret (Endangered)	MT, ND, SD, WY, NE. Due to human disturbances adjacent to levees and lack of prairie dog towns, these species likely would not occur at project locations.	No Affect	None
Blowout Penstemon (Endangered)	NE & WY. Requires shifting sand in blowouts; not likely to occur at project sites.	No Affect	None
Bonytail Chub (Endangered)	Colorado River. No depletions of water from any tributary to the Colorado River would occur.	No Affect	None
Bull Trout (Threatened)	Montana. Construction activities may lead to increased sediments which could affect water quality and feeding and breeding activity (Spawning in late fall. Incubation 4-5 months with hatching late winter or early spring. Fry remain in stream bed for 3 wks.)	May Affect, but Not Likely to Adversely Affect	BMP's (silt fences) would be used to reduce erosion and prevent degradation of water quality. Fall spawning period would be avoided.
Canada Lynx (Threatened)	Montana. Species avoids areas of human disturbance. Likely not found in the project areas.	No Affect	None
Colorado Butterfly Plant (Threatened)	WY and NE. Prefers open wetland habitat kept up by flooding. Likely not found along maintained levee systems.	No Affect.	None
Colorado Pike Minnow (Endangered)	Colorado River. No depletions of water from any tributary to the Colorado River would occur.	No Affect	None
Dakota Skipper (Candidate)	SD and ND. Occurs in Bluestem and Upland prairies. Likely not associated with maintained levee systems.	No Affect	None
Decurrent False Aster (Threatened)	MO. Agriculture reduces/eliminates habitat conditions. Likely not found on maintained levees.	No Affect	None

Desert Yellowhead (Threatened)	WY. (Fremont County). No projects proposed in the Beaver Rim area.	No Affect	None
Eastern Massasauga (Candidate)	MO and IA. Construction may harm, harass or kill snakes that occur within the project areas especially during hibernation (mid-October to mid-April). Gravid females give birth late July until mid-August and snakes may be active in higher, drier climates in the summer.	May Affect, but Not Likely to Adversely Affect	Conduct surveys prior to construction, and if sighted, consult with USFWS. If discovered during construction, stop work and consult with the USFWS.
Eskimo Curlew (Endangered)	SD. Formerly migrated through the Great Plains in spring. May be close to extinction. Likely does not occur in project areas.	No Affect	None
Fremont County Rockcress (Candidate)	WY. Found only in the Wind River. No projects are proposed in this area.	No Affect	None
Gray Bat (Endangered)	MO. Bats live in caves year-round. Gray bats do not occur in project areas.	No Affect	None
Gray Wolf (Threatened)	MT, WY, NE, ND, SD. No historical sightings within the project areas. The project areas do not have contiguous forests or suitable prey for wolves. It is unlikely that this species would transit the areas due to distance from known populations.	No Affect	None
Greater Sage Grouse (Candidate)	MT, ND, SD, WY. Construction may temporarily displace species in sagebrush areas; affect feeding, breeding & sheltering. Mating season begins in March, with females laying eggs mid-March – mid-May. Birds cannot survive where sagebrush no longer exists.	May Affect, but Not Likely to Adversely Affect	In sage-brushed areas, conduct surveys prior to construction, and if sighted or if impacts to habitat would occur, consult with USFWS. Avoid disturbance to leks within ¼ mile; avoid human activity mid-March to mid-May (6pm-8am) within ¼ mile. If a lek is discovered during construction, stop work and consult with the USFWS.
Grizzly Bear (Threatened)	MT and WY. Project areas are likely out of the bear's preferred habitat, but they will use road areas.	No Affect	For safety reasons, construction crews should review the bear fact sheet. (Attached).

Higgins Eye Pearly Mussel (Endangered)	IA (Rock River) and MO (Mississippi). No work would be conducted in these areas.	No Affect	None
Hine's Emerald Dragonfly (Endangered)	Missouri. Located in spring-fed marshes and sedge meadows. No work would be conducted in these areas,	No Affect	None
Humpback Chub (Endangered)	Colorado River. No depletions of water from any tributary to the Colorado River would occur.	No Affect	None
Indiana Bat (Endangered)	MO and IA. Summer construction activities may temporarily displace species from roosting habitat (trees with exfoliating bark).	May Affect, but Not Likely to Adversely Affect during summer construction.	Conduct surveys for potential habitat (trees with exfoliating bark) prior to construction, and if potential habitat is present, consult with USFWS. If bats or potential habitat is discovered during construction, stop work and consult with the USFWS.
Iowa Pleistocene Snail (Endangered)	Iowa. Found in cool and moist hillsides. No work is proposed in these areas.	No Affect	None
Least Tern (Endangered)	MO, IA, NE, SD, ND, MT. The species is present in reaches along the Missouri, Platte, and Niobrara rivers during the spring and summer months. Nesting and rearing typically occurs April-August. Construction activities could destroy nests or cause nest abandonment. Work is scheduled to occur outside of when birds use affected shorelines and sandbars (April to August) but may occur within the timeframe.	May Affect, but Not Likely to Adversely Affect	Avoid nesting season (April-August). If work must occur during nesting season, a pre-construction nest survey would be conducted. If nests are discovered within ½ mile of construction site, consultation with USFWS would occur. If terns initiate nesting in the vicinity (½mile) of construction activities, work would stop and USFWS would be contacted.
Mead's Milkweed (Threatened)	MO and IA. Occurs in upland prairies. No work is proposed in these areas.	No Affect	None
Mountain Plover (Proposed)	MT, WY, NE. Dependent on Prairie dog colonies. No work is proposed in these areas.	No Affect	None

North American Wolverine (Candidate)	MT and WY. The species avoids areas of human disturbance. The species is not associated with levee areas.	No Affect	None
Pallid Sturgeon (Endangered)	MO, IA, NE, SD, ND, MT. Project-related activities are not expected to affect water quality or quantity in the rivers used by the pallid sturgeon. Temporary, construction-related increases in turbidity (channel work only) could be beneficial if outside spawning periods.	May Affect, but Not Likely to Adversely Affect. Potential beneficial effects.	BMPs are in place to reduce terrestrial erosion. If construction requires temporary reduction in flows or dredging activities, consultation with the FWS would be conducted. In channel work (dredging) would be coordinated with the FWS. . Limit construction activities outside of spawning period.
Pink Mucket Mussel (Endangered)	MO. Burying or displacement could occur. Turbidity from construction may clog the species feeding siphons or bury it. Spawning and glochidial release periods occur in spring and summer.	May Affect, but Not Likely to Adversely Affect	BMPs (silt fences) would be used to reduce erosion. BMPs (silt fences) would be used to reduce erosion and associated turbidity. Pre-construction surveys would be conducted in streams known to be used by this species.
Piping Plover (Threatened)	NE, IA, SD, ND, MT. The species is present in the Missouri, Platte, Niobrara, Loup, and Elkhorn river reaches. Work is scheduled to occur outside of when birds use affected shorelines or sandbars (April to August) but may occur within that timeframe. Riverwash/sands on agricultural lands may be used by the species for nesting prior to levee work being conducted.	May Affect, but Not Likely to Adversely Affect	Avoid nesting season (April-August). If nesting season cannot be avoided, conduct surveys prior to construction, and if sighted within ½ mile, consult with USFWS. If plovers initiate nesting in the vicinity (½mile) of the repair, work would stop and FWS would be contacted. If construction were required during the nesting season and in areas of known nests, fledglings, or newly created riverwash areas (½mile), consultation with FWS would be conducted.
Prairie Bush Clover (Threatened)	IA. Found in tall-grass prairies. No work would occur in these areas.	No Affect	None

Rabbits Foot Mussel (Candidate)	MO. Burying or displacement could occur. Turbidity from construction may clog the species feeding siphons or bury it. Spawning and glochidial release periods occur in spring and summer.	May Affect, but Not Likely to Adversely Affect	BMPs (silt fences) would be used to reduce erosion and associated turbidity. Pre-construction surveys would be conducted in streams known to be used by this species.
Razorback Sucker (Endangered)	Colorado River. No depletions of water from any tributary to the Colorado River would occur.	No Affect	None
Running Buffalo Clover (Endangered)	MO. Not located in areas of full sun or severe disturbance. Likely not located on levees.	No Affect	None
Salt Creek Tiger Beetle (Endangered)	NE. Lancaster and Saunders counties. Requires mud and saline wetlands. Likely not associated with levee habitat.	No Affect	None
Scaleshell Mussel (Endangered)	MO. Burying or displacement could occur. Turbidity from construction may make feeding difficult or may suffocate the species. Spawning and glochidial release periods occur in spring and summer.	May Affect, but Not Likely to Adversely Affect	BMPs (silt fences) would be used to reduce erosion and associated turbidity. Pre-construction surveys would be conducted in streams known to be used by this species.
Sheep-Nose Mussel (Proposed)	IA and MO. Burying or displacement could occur. Turbidity from construction may make feeding difficult or may suffocate the species. Spawning and glochidial release periods occur in spring and summer.	May Affect, but Not Likely to Adversely Affect	BMPs (silt fences) would be used to reduce erosion and associated turbidity. Pre-construction surveys would be conducted in streams known to be used by this species.
Slender Moonwort (Candidate)	MT. Very rare. No sightings since 1900's. Likely does not occur at project sites.	No Affect	None
Spectaclecase Mussel (Proposed)	IA and MO. Burying or displacement could occur. Turbidity from construction may make feeding difficult or may suffocate the species. Spawning and glochidial release periods occur in spring and summer.	May Affect, but Not Likely to Adversely Affect	BMPs (silt fences) would be used to reduce erosion and associated turbidity. Pre-construction surveys would be conducted in streams known to be used by this species.
Sprague's Pipit (Candidate)	MT, ND, and SD. Species avoid cultivated areas. Not likely to occur in project areas.	No Affect	None

Topeka Shiner (Endangered)	SD, IA, NE, MO. Turbidity from construction may affect feeding and breeding shiners.	May Affect, but Not Likely to Adversely Affect	BMPs (silt fences) would be used to reduce erosion. Avoid spawning period (late May to mid-July)
Ute Ladies' Tresses (Threatened)	NE, WY and MT. Grows in wet sandy areas. Likely does not occur on levees.	No Affect	None
Virginia Sneezeweed (Threatened)	MO. Occurs in seasonal ponds. May be affected by Advanced Measures filling of wetland areas.	May Affect, but Not Likely to Adversely Affect	Conduct surveys prior to Advanced Measures, and if sighted, consult with USFWS.
Zaitzevian Riffle Beetle (Candidate)	MT. Occurs only in Gallatin County in warm springs. Does not occur on levees.	No Affect	None
Water Howellia (Threatened)	MT. Associated with ponds. Likely does not occur on levees.	No Affect	None
Western Prairie-Fringed Orchid (Threatened)	IA, NE, and ND. Occurs in tall grass prairie areas. Does not occur on levees. Staging materials in tall grass areas may smash the species.	May Affect, but Not Likely to Adversely Affect	Conduct surveys of any tall grass unbroken native prairie areas used as staging prior to construction, and if sighted, consult with USFWS.
White Bark Pine(Candidate)	MT. Found in sub-alpine and alpine sites. Not located on levees.	No Affect	None
Whooping Crane (Endangered)	MT, NE, ND, and SD. Migrating cranes could stopover along banks and sandbars within the project areas. Project construction may occur during the migration season (April to May and September to November). Construction related activities may harass the species.	May Affect, but Not Likely to Adversely Affect	Conduct surveys prior to construction, and if sighted, consult with USFWS. If discovered during construction, stop work and consult with the USFWS.
Yellow-Billed Cuckoo (Candidate)	Listed as candidate species in MT and WY. More commonly found in the eastern states (NE, IA, MO, SD) as a spring and fall migrant and summer resident. Requires woody, shrubby vegetation which is not found on levees. Clearing of cottonwoods and willows for staging areas could affect nesting habitat.	May Affect, but Not Likely to Adversely Affect.	Conduct surveys prior to clearing vegetation and if sighted, consult with USFWS. If discovered during construction, stop work and consult with the USFWS. Alternatively, clear vegetation outside of nesting season (April to September).

Cumulative Impacts

The Council on Environmental Quality (CEQ) Regulations defines cumulative impacts as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time” (CEQ, 1997). These actions include on- or off-site projects conducted by government agencies, businesses, communities, or individuals that are within the spatial and temporal boundaries of the current actions being considered. The geographical areas of consideration are actions located within/along the floodplain of the Missouri River and its tributaries over the course of the last century.

The Missouri River and its tributaries have been altered by past actions such as bank stabilization, dams, roads/bridges, agricultural and urban levees, channelization, water withdrawal for human and agricultural use, urbanization and other human uses. These activities have substantially altered the terrestrial and aquatic ecosystem within the watersheds under consideration. Some examples of the alterations that have occurred include: wetland losses, development of the floodplain, conversion of riparian habitat to agriculture and urban development, and the cut-off of the floodplain from the river. Much of the conversion of riparian habitat to agriculture lands occurred prior to construction of levees with nearly 50 percent of the Missouri River floodplain being in agricultural production by 1937 (Bragg and Tatschl, 1977). In 1912, the USACE started constructing the Missouri River Bank Stabilization and Navigation Project (BSNP) which channelized and stabilized the Missouri River and significantly altered flows. It is estimated that 522,000 acres of aquatic and terrestrial habitat was lost in and along the Missouri River, between 1912 and 2003, due to the construction and operation of the BSNP (USACE, 1981).

The rehabilitation of levees usually consists of repairs through minor levee setbacks and/or repairs of existing structures to their previous condition. Advanced Measures responses consist of temporary structures that are removed once the flood has passed. These projects typically result in minor short-term construction related impacts to agricultural lands, wetlands, fish and wildlife and the habitats upon which they depend. In cases of major levee setbacks where large blow holes in the levee have occurred, setting back the levee restores the floodplain to the benefit of fish and wildlife, including threatened and endangered species; increases conveyance; lowers flood stages; re-introduces the floodplain/river interaction; and provides increased nutrient exchange. These activities have considerable beneficial effects to the ecology of the river similar to those being pursued under other programs meant to reverse past trends, and thus, such actions are compatible with restoration and recovery of species.

The cumulative impacts of the proposed actions when added to other present and future actions, and when added to the past degradation actions on the Missouri River and its tributaries, do not result in a net increase in impacts to threatened and endangered species. Thus, no significant negative cumulative impacts associated with threatened and endangered species have been identified.

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States, Waterways, Counties, and Threatened & Endangered Species

PL 84-99 Emergency Levee Rehabilitation Program & Advanced Measures Civil Emergency Management Program

Montana

Yellowstone River

COUNTIES = **Richard:** Pallid Sturgeon, Piping Plover, Interior Least Tern, Whooping Crane

Dawson: Pallid Sturgeon, Interior Least Tern, Whooping Crane

Prairie: Pallid Sturgeon, Interior Least Tern, Black-footed Ferret

Custer: Pallid Sturgeon, Interior Least Tern, Black-footed Ferret, Whooping Crane

Rosebud: Interior Least Tern, Black-footed Ferret

Treasure: None

Yellowstone: Black-footed Ferret, Whooping Crane

Stillwater: Grizzly Bear, Gray Wolf, Canada Lynx, Black-footed Ferret

Carbon: Grizzly Bear, Gray Wolf, Canada Lynx, Black-footed Ferret

Sweet Grass: Grizzly Bear, Gray Wolf, Canada Lynx, Black-footed Ferret

Park: Grizzly Bear, Gray Wolf, Canada Lynx

Cherry Creek

COUNTIES = Gallatin County = Grizzly Bear, Warm Spring Zaitzevian Riffle Beetle, Ute Ladies' Tresses, Gray Wolf, Canada Lynx

Sun River

COUNTIES = Lewis and Clark: Grizzly Bear, Gray Wolf, Canada Lynx, Bull Trout, Black-footed Ferret

Teton: Grizzly Bear, Gray Wolf, Canada Lynx

Cascade: None

Milk River

COUNTIES = Glacier: Grizzly Bear, Gray Wolf, Canada Lynx, Bull Trout, Slender Moonwort

Hill: Black-footed Ferret

Blaine: Pallid Sturgeon, Black-footed Ferret

Phillips: Pallid Sturgeon, Piping Plover, Black-footed Ferret, Whooping Crane

Valley: Pallid Sturgeon, Piping Plover, Black-footed Ferret, Interior Least Tern, Whooping Crane

Beaver Creek

COUNTIES = Missoula County = Grizzly Bear, Water Howellia, Gray Wolf, Canada Lynx, Bull Trout, Yellow-billed Cuckoo

Nebraska

Big Papio

COUNTIES = Sarpy = Gray Wolf, Interior Least Tern, Pallid Sturgeon, Piping Plover, Western Prairie Fringed Orchid

Mud Creek

COUNTIES = Buffalo = Black-footed Ferret, Gray Wolf, Interior Least Tern, Piping Plover, Western Prairie Fringed Orchid, Whooping Crane

Dodge = Gray Wolf, Interior Least Tern, Pallid Sturgeon, Piping Plover, Western Prairie Fringed Orchid

Sarpy = Gray Wolf, Interior Least Tern, Pallid Sturgeon, Piping Plover, Western Prairie Fringed Orchid

Burt = Gray Wolf, Pallid Sturgeon, Western Prairie Fringed Orchid

Cherry = American Burying Beetle, Black-footed Ferret, Blowout Penstemon, Gray Wolf, Topeka Shiner, Western Prairie Fringed Orchid, Whooping Crane

Gage = Gray Wolf, Western Prairie Fringed Orchid

Wheeler = American Burying Beetle, Black-footed Ferret, Gray Wolf, Western Prairie Fringed Orchid, Whooping Crane

Cass = Gray Wolf, Interior Least Tern, Pallid Sturgeon, Piping Plover, Western Prairie Fringed Orchid

Cedar Creek

COUNTIES = Webster = Black-footed Ferret, Gray Wolf, Whooping Crane

Cass = Gray Wolf, Interior Least Tern, Pallid Sturgeon, Piping Plover, Western Prairie Fringed Orchid

Frontier = American Burying Beetle, Black-footed Ferret, Gray Wolf, Whooping Crane

Gage = Gray Wolf, Western Prairie Fringed Orchid

Sioux = Black-footed Ferret, Gray Wolf, Ute Ladies' Tresses, Whooping Crane

Keith = Black-footed Ferret, Blowout Penstemon, Gray Wolf, Interior Least Tern, Piping Plover, Whooping Crane

Wheeler = American Burying Beetle, Black-footed Ferret, Gray Wolf, Western Prairie Fringed Orchid, Whooping Crane

Stanton = Gray Wolf, Interior Least Tern, Piping Plover, Western Prairie Fringed Orchid

Loup = American Burying Beetle, Black-footed Ferret, Gray Wolf, Western Prairie Fringed Orchid, Whooping Crane

Howard = Black-footed Ferret, Gray Wolf, Interior Least Tern, Piping Plover, Western Prairie Fringed Orchid, Whooping Crane

Boone = American Burying Beetle, Black-footed Ferret, Gray Wolf, Western Prairie Fringed Orchid, Whooping Crane

Cherry = American Burying Beetle, Black-footed Ferret, Blowout Penstemon, Gray Wolf, Topeka Shiner, Western Prairie Fringed Orchid, Whooping Crane

Morrill = Black-footed Ferret, Blowout Penstemon, Gray Wolf, Whooping Crane

Buffalo = Black-footed Ferret, Gray Wolf, Interior Least Tern, Piping Plover, Western Prairie Fringed Orchid, Whooping Crane

Maple Creek

COUNTIES = Dodge = Gray Wolf, Interior Least Tern, Pallid Sturgeon, Piping Plover, Western Prairie Fringed Orchid

Furnas = Black-footed Ferret, Gray Wolf, Whooping Crane

Lost Creek

COUNTIES = Platte = Black-footed Ferret, Gray Wolf, Interior Least Tern, Pallid Sturgeon, Piping Plover, Western Prairie Fringed Orchid, Whooping Crane

Boyd = American Burying Beetle, Black-footed Ferret, Gray Wolf, Interior Least Tern, Pallid Sturgeon, Piping Plover, Western Prairie Fringed Orchid, Whooping Crane

Knox = American Burying Beetle, Black-footed Ferret, Gray Wolf, Interior Least Tern, Pallid Sturgeon, Piping Plover, Western Prairie Fringed Orchid, Whooping Crane

Phelps = Black-footed Ferret, Gray Wolf, Interior Least Tern, Piping Plover, Western Prairie Fringed Orchid, Whooping Crane

Nuckolls = Black-footed Ferret, Gray Wolf, Whooping Crane

Garden = Black-footed Ferret, Blowout Penstemon, Gray Wolf, Whooping Crane

Webster = Black-footed Ferret, Gray Wolf, Whooping Crane

Franklin = Black-footed Ferret, Gray Wolf, Whooping Crane

Cherry = American Burying Beetle, Black-footed Ferret, Blowout Penstemon, Gray Wolf, Topeka Shiner, Western Prairie Fringed Orchid, Whooping Crane

Loup River

COUNTIES = Howard = Black-footed Ferret, Gray Wolf, Interior Least Tern, Piping Plover, Western Prairie Fringed Orchid, Whooping Crane

Nance = Black-footed Ferret, Gray Wolf, Interior Least Tern, Piping Plover, Western Prairie Fringed Orchid, Whooping Crane

Platte = Black-footed Ferret, Gray Wolf, Interior Least Tern, Pallid Sturgeon, Piping Plover, Western Prairie Fringed Orchid, Whooping Crane

Polk = Black-footed Ferret, Gray Wolf, Interior Least Tern, Piping Plover, Western Prairie fringed Orchid, Whooping Crane

Gering Drain = information not readily available

Wood River

COUNTIES = Custer = American Burying Beetle, Black-footed Ferret, Blowout Penstemon, Gray Wolf, Interior Least Tern, Piping Plover, Western Prairie Fringed Orchid, Whooping Crane

Dawson = American Burying Beetle, Black-footed Ferret, Gray Wolf, Interior Least Tern, Piping Plover, Western Prairie Fringed Orchid, Whooping Crane

Buffalo = Black-footed Ferret, Gray Wolf, Interior Least Tern, Piping Plover, Western Prairie Fringed Orchid, Whooping Crane

Hall = Black-footed Ferret, Gray Wolf, Interior Least Tern, Piping Plover, Western Prairie Fringed Orchid, Whooping Crane

Hamilton = Black-footed Ferret, Gray Wolf, Interior Least Tern, Piping Plover, Western Prairie Fringed Orchid, Whooping Crane

Merrick = Black-footed Ferret, Gray Wolf, Interior Least Tern, Piping Plover, Western Prairie Fringed Orchid, Whooping Crane

Elkhorn River

COUNTIES = Rock = American Burying Beetle, Black-footed Ferret, Blowout Penstemon, Gray Wolf, Interior Least Tern, Piping Plover, Western Prairie Fringed Orchid, Whooping Crane

Holt = American Burying Beetle, Black-footed Ferret, Gray Wolf, Interior Least Tern, Piping Plover, Western Prairie Fringed Orchid, Whooping Crane

Antelope = American Burying Beetle, Black-footed Ferret, Gray Wolf, Western Prairie Fringed Orchid, Whooping Crane

Madison = Black-footed Ferret, Gray Wolf, Interior Least Tern, Piping Plover, Topeka Shiner, Western Prairie Fringed Orchid, Whooping Crane

Stanton = Gray Wolf, Interior Least Tern, Piping Plover, Western Prairie Fringed Orchid

Cuming = Gray Wolf, Interior Least Tern, Piping Plover, Western Prairie Fringed Orchid

Dodge = Gray Wolf, Interior Least Tern, Pallid Sturgeon, Piping Plover, Western Prairie Fringed Orchid

Missouri River

COUNTIES = Boyd = American Burying Beetle, Black-footed Ferret, Gray Wolf, Interior Least Tern, Pallid Sturgeon, Piping Plover, Western Prairie Fringed Orchid, Whooping Crane

Knox = American Burying Beetle, Black-footed Ferret, Gray Wolf, Interior Least Tern, Pallid Sturgeon, Piping Plover, Western Prairie Fringed Orchid, Whooping Crane

Cedar = Gray Wolf, Interior Least Tern, Pallid Sturgeon, Piping Plover, Scaleshell Mussel, Western Prairie Fringed Orchid

Dixon = Gray Wolf, Interior Least Tern, Pallid Sturgeon, Piping Plover, Western Prairie Fringed Orchid

Dakota = Gray Wolf, Pallid Sturgeon, Western Prairie Fringed Orchid

Thurston = Gray Wolf, Pallid Sturgeon, Western Prairie Fringed Orchid

Burt = Gray Wolf, Pallid Sturgeon, Western Prairie Fringed Orchid

Washington = Gray Wolf, Pallid Sturgeon, Western Prairie Fringed Orchid

Douglas = Interior Least Tern, Pallid Sturgeon, Piping Plover, Western Prairie Fringed Orchid

Sarpy = Gray Wolf, Interior Least Tern, Pallid Sturgeon, Piping Plover, Western Prairie Fringed Orchid

Cass = Gray Wolf, Interior Least Tern, Pallid Sturgeon, Piping Plover, Western Prairie Fringed Orchid

Otoe = Gray Wolf, Pallid Sturgeon, Western Prairie Fringed Orchid

Nemaha = Gray Wolf, Pallid Sturgeon, Western Prairie Fringed Orchid
Richardson = Gray Wolf, Pallid Sturgeon, Western Prairie Fringed Orchid

Salt Creek

COUNTIES = Saunders = Gray Wolf, Interior Least Tern, Pallid Sturgeon, Piping Plover, Salt Creek Tiger Beetle, Western Prairie Fringed Orchid

Haines

COUNTIES = Lancaster = Gray Wolf, Salt Creek Tiger Beetle, Western Prairie Fringed Orchid

Middle Creek

COUNTIES = Seward = Black-footed Ferret, Gray Wolf, Western Prairie Fringed Orchid, Whooping Crane

Keya Paha = American Burying Beetle, Black-footed Ferret, Blowout Penstemon, Gray Wolf, Interior Least Tern, Piping Plover, Western Prairie Fringed Orchid, Whooping Crane

Nuckolls = Black-footed Ferret, Gray Wolf, Whooping Crane

Dawes = Black-footed Ferret, Gray Wolf, Whooping Crane

Morrill = Black-footed Ferret, Blowout Penstemon, Gray Wolf, Whooping Crane

Thurston = Gray Wolf, Pallid Sturgeon, Western Prairie Fringed Orchid

Oak Creek

COUNTIES = Webster = Black-footed Ferret, Gray Wolf, Whooping Crane

Nuckolls = Black-footed Ferret, Gray Wolf, Whooping Crane

Valley = American Burying Beetle, Black-footed Ferret, Gray Wolf, Interior Least Tern, Piping Plover, Western Prairie Fringed Orchid, Whooping Crane

Rock = American Burying Beetle, Black-footed Ferret, Blowout Penstemon, Gray Wolf, Interior Least Tern, Piping Plover, Western Prairie Fringed Orchid, Whooping Crane

Keya Paha = American Burying Beetle, Black-footed Ferret, Blowout Penstemon, Gray Wolf, Interior Least Tern, Piping Plover, Western Prairie Fringed Orchid, Whooping Crane

Holt = American Burying Beetle, Black-footed Ferret, Gray Wolf, Interior Least Tern, Piping Plover, Western Prairie Fringed Orchid, Whooping Crane

Seward = Black-footed Ferret, Gray Wolf, Western Prairie Fringed Orchid, Whooping Crane

Sherman = Black-footed Ferret, Gray Wolf, Interior Least Tern, Piping Plover, Western Prairie Fringed Orchid, Whooping Crane

Deadmans Run

COUNTIES = Lancaster = Gray Wolf, Salt Creek Tiger Beetle, Western Prairie Fringed Orchid

Little Papio

COUNTIES = Washington = Gray Wolf, Pallid Sturgeon, Western Prairie Fringed Orchid

Blackbird Creek

COUNTIES = Thurston = Gray Wolf, Pallid Sturgeon, Western Prairie Fringed Orchid

Union Creek

COUNTIES = Stanton = Gray Wolf, Interior Least Tern, Piping Plover, Western Prairie Fringed Orchid

Buffalo Creek

COUNTIES = Keya Paha = American Burying Beetle, Black-footed Ferret, Blowout Penstemon, Gray Wolf, Interior Least Tern, Piping Plover, Western Prairie Fringed Orchid, Whooping Crane

Nuckolls = Black-footed Ferret, Gray Wolf, Whooping Crane

Dundy = Black-footed Ferret, Gray Wolf

Red Willow = Black-footed Ferret, Gray Wolf, Piping Plover, Whooping Crane

Sarpy = Gray Wolf, Interior Least Tern, Pallid Sturgeon, Piping Plover, Western Prairie Fringed Orchid

Dawson = American Burying Beetle, Black-footed Ferret, Gray Wolf, Interior Least Tern, Piping Plover, Western Prairie Fringed Orchid, Whooping Crane

Madison = Black-footed Ferret, Gray Wolf, Interior Least Tern, Piping Plover, Topeka Shiner, Western Prairie Fringed Orchid, Whooping Crane

Big Elk Creek

COUNTIES = Sarpy = Gray Wolf, Interior Least Tern, Pallid Sturgeon, Piping Plover, Western Prairie Fringed Orchid

Copper Creek

COUNTIES = Sarpy = Gray Wolf, Interior Least Tern, Pallid Sturgeon, Piping Plover, Western Prairie Fringed Orchid

Betz Ditch

COUNTIES = Sarpy = Gray Wolf, Interior Least Tern, Pallid Sturgeon, Piping Plover, Western Prairie Fringed Orchid

Whitted Creek

COUNTIES = Sarpy = Gray Wolf, Interior Least Tern, Pallid Sturgeon, Piping Plover, Western Prairie Fringed Orchid

Thompson Creek = information not readily available

Logan Creek

COUNTIES = Johnson = Gray Wolf, Western Prairie Fringed Orchid, Whooping Crane

Little Nemaha

COUNTIES = Nemaha = Gray Wolf, Pallid Sturgeon, Western Prairie Fringed Orchid

Happy Hollow = information not readily available

Moores

COUNTIES = Merrick = Black-footed Ferret, Gray Wolf, Interior Least Tern, Piping Plover, Western Prairie Fringed Orchid, Whooping Crane

Washington = Gray Wolf, Pallid Sturgeon, Western Prairie Fringed Orchid

Jarvis Creek

COUNTIES = Nemaha = Gray Wolf, Pallid Sturgeon, Western Prairie Fringed Orchid

Whiskey Run

COUNTIES = Jefferson = Black-footed Ferret, Gray Wolf, Western Prairie Fringed Orchid, Whooping Crane

Richardson = Gray Wolf, Pallid Sturgeon, Western Prairie Fringed Orchid

Platte River

COUNTIES = Lincoln = American Burying Beetle, Black-footed Ferret, Blowout Penstemon, Gray Wolf, Interior Least Tern, Piping Plover, Western Prairie Fringed Orchid, Whooping Crane

Dawson = American Burying Beetle, Black-footed Ferret, Gray Wolf, Interior Least Tern, Piping Plover, Western Prairie Fringed Orchid, Whooping Crane

Phelps = Black-footed Ferret, Gray Wolf, Interior Least Tern, Piping Plover, Western Prairie Fringed Orchid, Whooping Crane

Kearney = Black-footed Ferret, Gray Wolf, Interior Least Tern, Piping Plover, Whooping Crane

Buffalo = Black-footed Ferret, Gray Wolf, Interior Least Tern, Piping Plover, Western Prairie Fringed Orchid, Whooping Crane

Hall = Black-footed Ferret, Gray Wolf, Interior Least Tern, Piping Plover, Western Prairie Fringed Orchid, Whooping Crane

Hamilton = Black-footed Ferret, Gray Wolf, Interior Least Tern, Piping Plover, Western Prairie Fringed Orchid, Whooping Crane

Merrick = Black-footed Ferret, Gray Wolf, Interior Least Tern, Piping Plover, Western Prairie Fringed Orchid, Whooping Crane

Polk = Black-footed Ferret, Gray Wolf, Interior Least Tern, Piping Plover, Western Prairie Fringed Orchid, Whooping Crane

Butler = Black-footed Ferret, Gray Wolf, Interior Least Tern, Pallid Sturgeon, Piping Plover, Western Prairie Fringed Orchid, Whooping Crane

Colfax = Black-footed Ferret, Gray Wolf, Interior Least Tern, Pallid Sturgeon, Piping Plover, Western Prairie Fringed Orchid

Dodge = Gray Wolf, Interior Least Tern, Pallid Sturgeon, Piping Plover, Western Prairie Fringed Orchid

Saunders = Gray Wolf, Interior Least Tern, Piping Plover, Salt Creek Tiger Beetle, Western Prairie Fringed Orchid

Douglas = Interior Least Tern, Pallid Sturgeon, Piping Plover, Western Prairie Fringed Orchid

Sarpy = Gray Wolf, Interior Least Tern, Pallid Sturgeon, Piping Plover, Western Prairie Fringed Orchid

Cass = Gray Wolf, Interior Least Tern, Pallid Sturgeon, Piping Plover, Western Prairie Fringed Orchid

Papillion Creek

COUNTIES = **Washington** = Gray Wolf, Pallid Sturgeon, Western Prairie Fringed Orchid

Douglas = Interior Least Tern, Pallid Sturgeon, Piping Plover, Western Prairie Fringed Orchid

Sarpy = Gray Wolf, Interior Least Tern, Pallid Sturgeon, Piping Plover, Western Prairie Fringed

Pebble Creek

COUNTIES = **Stanton** = Gray Wolf, Interior Least Tern, Piping Plover, Western Prairie Fringed Orchid

Antelope = American Burying Beetle, Black-footed Ferret, Gray Wolf, Western Prairie Fringed Orchid, Whooping Crane

Dawes = Black-footed Ferret, Gray Wolf, Whooping Crane

Lodgepole Creek

COUNTIES = **Kimball** = Black-footed Ferret, Colorado Butterfly Plant, Gray Wolf, Mountain Plover

Cheyenne = Black-footed Ferret, Gray Wolf, Mountain Plover, Whooping Crane

Deuel = Black-footed Ferret, Gray Wolf

Deadwood Draw = information not readily available

West Papio

COUNTIES = **Sarpy** = Gray Wolf, Interior Least Tern, Pallid Sturgeon, Piping Plover, Western Prairie Fringed Orchid

North Dakota

Lower Heart River

COUNTIES = Billings: Black-footed Ferret, Gray Wolf, Whooping Crane

Stark: Black-footed Ferret, Gray Wolf, Whooping Crane

Grant: Black-footed Ferret, Gray Wolf, Whooping Crane

Morton: Black-footed Ferret, Gray Wolf, Interior Least Tern, Pallid Sturgeon, Piping Plover, Whooping Crane

Little Beaver Creek

COUNTIES = Bowman: Black-footed Ferret, Gray Wolf, Greater Sage-grouse, Whooping Crane

Slope: Black-footed Ferret, Gray Wolf, Greater Sage-grouse, Whooping Crane

(Scenic) Little Missouri River

COUNTIES = Slope: Black-footed Ferret, Gray Wolf, Greater Sage-grouse, Whooping Crane

Billings: Black-footed Ferret, Gray Wolf, Whooping Crane

Dunn: Black-footed Ferret, Dakota Skipper, Gray Wolf, Interior Least Tern, Pallid Sturgeon, Piping Plover, Whooping Crane

McKenzie: Black-footed Ferret, Gray Wolf, Interior Least Tern, Pallid Sturgeon, Piping Plover, Whooping Crane

Buffalo Creek

COUNTIES = Cass: Gray Wolf, Whooping Crane

South Dakota

Moccasin Creek = Brown = Eskimo Curlew, Whooping Crane, Topeka Shiner, Dakota Skipper

Belle Fourche = Butte = Whooping Crane, Greater Sage Grouse, Sprague's Pipit

Meade = Whooping Crane, Least Tern, Sprague's Pipit

Spring Creek

COUNTIES = McPherson = Whooping Crane, Sprague's Pipit, Dakota Skipper

Campbell = Whooping Crane, Piping Plover, Least Tern, Pallid Sturgeon, Sprague's Pipit

Pennington = Whooping Crane, Least Tern, Black-footed Ferret, Sprague's Pipit

Custer = Whooping Crane, Black-footed Ferret, Sprague's Pipit

Fall River = information not readily available

Big Sioux River

COUNTIES = Grant = Topeka Shiner, Dakota Skipper

Codington = Whooping Crane, Topeka Shiner, Dakota Skipper

Hamlin = Whooping Crane, Topeka Shiner, Dakota Skipper

Bookings = Topeka Shiner, Western Prairie Fringed Orchid, Dakota Skipper

Moody = Topeka Shiner, Western Prairie Fringed Orchid, Dakota Skipper

Minnehaha = Topeka Shiner, Western Prairie Fringed Orchid

Lincoln = Pallid Sturgeon, Topeka Shiner, Western Prairie Fringed Orchid

Union = Piping Plover, Least Tern, Pallid Sturgeon, Topeka Shiner, Western Prairie Fringed Orchid, Scaleshell Mussel

Rapid Creek = Pennington = Whooping Crane, Least Tern, Black-footed Ferret, Sprague's Pipit

Skunk Creek = Minnehaha = Topeka Shiner, Western Prairie Fringed Orchid

Deadmans Gulch = Meade = Whooping Crane, Least Tern, Sprague's Pipit

Wyoming

Bighorn

COUNTIES = Fremont: Black-footed Ferret, Blowout Penstemon, Canada Lynx (CX), Bonytail, Colorado Pikeminnow, Humpback Chub, Razorback Sucker, Desert Yellowhead (CX), Fremont County Rockcress, Gray Wolf, Greater Sage-grouse, Grizzly Bear, North American Wolverine, Least Tern, Pallid Sturgeon, Piping Plover, Western Prairie-fringed Orchid, Whooping Crane, Ute Ladies'-tresses, Whitebark Pine, Yellow-billed Cuckoo

Hot Springs: Black-footed Ferret, Canada Lynx, Gray Wolf, Greater Sage-grouse, Grizzly Bear, Mountain Plover, Ute Ladies'-tresses, Wolverine

Washakie: Black-footed Ferret, Canada Lynx, Greater Sage-grouse, Mountain Plover, Ute Ladies'-tresses

Big Horn: Black-footed Ferret, Canada Lynx, Gray Wolf, Greater Sage-grouse, Mountain Plover, Ute Ladies'-tresses

Johnson: Canada Lynx, Greater Sage-grouse, Mountain Plover, Ute Ladies'-tresses

Sheridan: Canada Lynx, Greater Sage-grouse, Mountain Plover, Ute Ladies'-tresses

Dry Creek

COUNTIES = Park: Black-footed Ferret, Canada Lynx, Gray Wolf, Greater Sage Grouse, Grizzly Bear, Mountain Plover, Ute Ladies'-tresses, Wolverine

Hot Springs: Black-footed Ferret, Canada Lynx, Gray Wolf, Greater Sage-grouse, Grizzly Bear, Mountain Plover, Ute Ladies'-tresses, Wolverine

Fremont: Black-footed Ferret, Blowout Penstemon, Canada Lynx (CX), Bonytail, Colorado Pikeminnow, Humpback Chub, Razorback Sucker, Desert Yellowhead (CX), Fremont County Rockcress, Gray Wolf, Greater Sage-grouse, Grizzly Bear, North American Wolverine, Least Tern, Pallid Sturgeon, Piping Plover, Western Prairie-fringed Orchid, Whooping Crane, Ute Ladies'-tresses, Whitebark Pine, Yellow-billed Cuckoo

Carbon: Black-footed Ferret, Blowout Penstemon, Canada Lynx, Bonytail, Colorado Pikeminnow, Humpback Chub, Razorback Sucker, Greater Sage-grouse, Mountain Plover, Interior Least Tern, Pallid Sturgeon, Piping Plover, Whooping Crane, Western Prairie-fringed Orchid, Ute Ladies'-tresses, Yellow-billed Cuckoo.

Goose Creek

COUNTIES = Sheridan: Canada Lynx, Greater Sage-grouse, Mountain Plover, Ute Ladies'-tresses

Iowa

East Boyer River

COUNTIES = Buena Vista: Western Prairie Fringed Orchid, Prairie Bush Clover, Topeka Shiner

Sac: Western Prairie Fringed Orchid, Prairie Bush Clover, Topeka Shiner

Crawford: Western Prairie Fringed Orchid, Prairie Bush Clover

Harrison: Western Prairie Fringed Orchid, Prairie Bush Clover, Pallid Sturgeon

Pottawattamie: Western Prairie Fringed Orchid, Prairie Bush Clover, Indiana Bat, Least Tern, Piping Plover, Pallid Sturgeon, Eastern Massasauga

Indian Creek

COUNTIES = Sac: Western Prairie Fringed Orchid, Prairie Bush Clover, Topeka Shiner

Louisa: Western Prairie Fringed Orchid, Prairie Bush Clover, Indiana Bat, Higgins Eye Pearly Mussel, Sheep-nose Mussel, Spectacular Case Mussel, Eastern Massasauga

Ringgold: Western Prairie Fringed Orchid, Prairie Bush Clover, Indiana Bat, Mead's Milkweed

Dry Creek = information not readily available

East Nishnabotna

COUNTIES = Carroll: Western Prairie Fringed Orchid, Prairie Bush Clover, Topeka Shiner

Audubon: Western Prairie Fringed Orchid, Prairie Bush Clover

Cass: Western Prairie Fringed Orchid, Prairie Bush Clover, Indiana Bat

Pottawattamie: Western Prairie Fringed Orchid, Prairie Bush Clover, Indiana Bat, Least Tern, Piping Plover, Pallid Sturgeon, Eastern Massasauga

Montgomery: Western Prairie Fringed Orchid, Prairie Bush Clover, Indiana Bat

Page: Western Prairie Fringed Orchid, Prairie Bush Clover, Indiana Bat

Fremont: Western Prairie Fringed Orchid, Prairie Bush Clover, Indiana Bat, Pallid Sturgeon

West Nishnabotna

COUNTIES = Carroll: Western Prairie Fringed Orchid, Prairie Bush Clover, Topeka Shiner

Crawford: Western Prairie Fringed Orchid, Prairie Bush Clover

Shelby: Western Prairie Fringed Orchid, Prairie Bush Clover

Pottawattamie: Western Prairie Fringed Orchid, Prairie Bush Clover, Indiana Bat, Least Tern, Piping Plover, Pallid Sturgeon, Eastern Massasauga

Mills: Western Prairie Fringed Orchid, Prairie Bush Clover, Indiana Bat, Pallid Sturgeon, Eastern Massasauga

Fremont: Western Prairie Fringed Orchid, Prairie Bush Clover, Indiana Bat, Pallid Sturgeon

Maple River

COUNTIES = Buena Vista: Western Prairie Fringed Orchid, Prairie Bush Clover, Topeka Shiner

Odebolt Creek

COUNTIES = Sac: Western Prairie Fringed Orchid, Prairie Bush Clover, Topeka Shiner

Missouri River

COUNTIES = Mills: Western Prairie Fringed Orchid, Prairie Bush Clover, Indiana Bat, Pallid Sturgeon, Eastern Massasauga

Harrison: Western Prairie Fringed Orchid, Prairie Bush Clover, Pallid Sturgeon

Pottawattamie: Western Prairie Fringed Orchid, Prairie Bush Clover, Indiana Bat, Least Tern, Piping Plover, Pallid Sturgeon, Eastern Massasauga

Fremont: Western Prairie Fringed Orchid, Prairie Bush Clover, Indiana Bat, Pallid Sturgeon

Waubansie Creek

COUNTIES = Fremont: Western Prairie Fringed Orchid, Prairie Bush Clover, Indiana Bat, Pallid Sturgeon

Mills: Western Prairie Fringed Orchid, Prairie Bush Clover, Indiana Bat, Pallid Sturgeon, Eastern Massasauga

Watkins Ditch

COUNTIES = Mills: Western Prairie Fringed Orchid, Prairie Bush Clover, Indiana Bat, Pallid Sturgeon, Eastern Massasauga

Pony Creek

COUNTIES = Mills: Western Prairie Fringed Orchid, Prairie Bush Clover, Indiana Bat, Pallid Sturgeon, Eastern Massasauga

Indian Creek

COUNTIES = Story: Western Prairie Fringed Orchid, Prairie Bush Clover

Mosquito Creek:

COUNTIES = Shelby: Western Prairie Fringed Orchid, Prairie Bush Clover

Wolf Creek:

COUNTIES = Grundy: Western Prairie Fringed Orchid, Prairie Bush Clover

Little Sioux

COUNTIES = Dickinson: Western Prairie Fringed Orchid, Prairie Bush Clover, Sheep-nose Mussel, Dakota Skipper

Bennet

COUNTIES = Cedar: Western Prairie Fringed Orchid, Prairie Bush Clover

Castana

COUNTIES = Monona: Western Prairie Fringed Orchid, Prairie Bush Clover, Pallid Sturgeon

Nagel

COUNTIES = Fayette: Western Prairie Fringed Orchid, Prairie Bush Clover, Iowa Pleistocene Snail

Beaver Creek:

COUNTIES = Boone: Western Prairie Fringed Orchid, Prairie Bush Clover

Dallas: Western Prairie Fringed Orchid, Prairie Bush Clover, Topeka Shiner

Polk:

Cottonwood Creek

COUNTIES= Monona: Western Prairie Fringed Orchid, Prairie Bush Clover, Pallid Sturgeon

Hogue Ditch = information not readily available

Harrison Ditch

COUNTIES = Monona: Western Prairie Fringed Orchid, Prairie Bush Clover, Pallid Sturgeon

West Fork Branch = information not readily available

Big Sioux

COUNTIES = Lyon: Western Prairie Fringed Orchid, Prairie Bush Clover, Topeka Shiner

Sioux: Western Prairie Fringed Orchid, Prairie Bush Clover

Plymouth: Western Prairie Fringed Orchid, Prairie Bush Clover

Floyd River

COUNTIES = O'Brien: Western Prairie Fringed Orchid, Prairie Bush Clover

Sioux: Western Prairie Fringed Orchid, Prairie Bush Clover

Plymouth: Western Prairie Fringed Orchid, Prairie Bush Clover

Woodbury: Western Prairie Fringed Orchid, Prairie Bush Clover, Least Tern, Piping Plover, Pallid Sturgeon

Missouri

Turkey Creek

COUNTIES = Madison: Gray Bat, Indiana Bat, Rabbits-foot Mussel, Running Buffalo Clover

Rock Creek

COUNTIES= Madison: Gray Bat, Indiana Bat, Rabbits-foot Mussel, Running Buffalo Clover

Jefferson: Gray Bat, Indiana Bat, Pallid Sturgeon, Pink Mucket Mussel, Scale-shell Mussel, Sheep-nose Mussel, Spectaclecase Mussel

Missouri River

COUNTIES = Atchison: Indiana Bat, Pallid Sturgeon, Western Prairie Fringed Orchid

Holt: Indiana Bat, Eastern Massasauga, Pallid Sturgeon, Western Prairie Fringed Orchid

Andrew: Indiana Bat, Pallid Sturgeon

Buchanan: Indiana Bat, Pallid Sturgeon

Platte: Indiana Bat, Eastern Massasauga, Pallid Sturgeon

Clay: Indiana Bat, Pallid Sturgeon

Ray: Indiana Bat, Pallid Sturgeon, Topeka Shiner

Lafayette: Pallid Sturgeon

Carroll: Indiana Bat, Pallid Sturgeon

Saline: Eastern Massasauga, Pallid Sturgeon

Howard: Gray Bat, Indiana Bat, Pallid Sturgeon, Running Buffalo Clover

Boone: Gray Bat, Indiana Bat, Pallid Sturgeon, Topeka Shiner, Running Buffalo Clover, Virginia sneezeweed

Callaway: Gray Bat, Indiana Bat, Pallid Sturgeon, Topeka Shiner, Running Buffalo Clover

Montgomery: Indiana Bat, Pallid Sturgeon, Running Buffalo Clover

Warren: Indiana Bat, Pallid Sturgeon

St. Charles: Indiana Bat, Least Tern, Eastern Massasauga, Pallid Sturgeon, Decurrent False Aster, Running Buffalo Clover

Mill Creek

COUNTIES = Morgan: Gray Bat, Topeka Shiner, Hine's Emerald Dragonfly

Nishnabotna

COUNTIES= Atchison: Indiana Bat, Pallid Sturgeon, Western Prairie Fringed Orchid